



Preview – Information



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Google Slides Lessons Preview





BC Math Curriculum

Measuring Unit – Grade 8

3-Part Lesson Format

Part 1 – Minds On!

- Learning Goals
- Discussion Questions
- Quotes
- And More!

Learning Goal

We are learning to represent cylinders as nets and calculate their surface area by adding the areas of their parts so we can understand how three-dimensional shapes connect to two-dimensional geometry.



Introduction – Area of a Triangle

Find the area of the triangles below ($A = b \times h \div 2$).
Drag the numbers to answer the questions.

mm² cm² m² 1 2 3 4 5 6 7 8 9 0.

 3m 12m	 8mm 17mm	 9cm 15cm
Area of a rectangle = _____	Area of a rectangle = _____	Area of a rectangle = _____
Area of a triangle = _____	Area of a triangle = _____	Area of a triangle = _____
 0.3m 100cm	 14.8cm 310mm	 2500mm 19m
Area of a rectangle = _____	Area of a rectangle = _____	Area of a rectangle = _____
Area of a triangle = _____	Area of a triangle = _____	Area of a triangle = _____

Part 2 – Action!

- Writing
- Matching
- Drag and Drop
- Drawing
- And More!

Part 3 – Consolidation!

- Exit Cards
- Quizzes
- Reflection
- And More!

Perimeter and Area – Word Problems

- 1) Noah is designing a triangular garden bed with a base of 8 metres and a height of 5 metres. After finding the area of the garden bed, he plans to cover it with mulch. If each bag of mulch covers 2 square metres, how many bags will he need?

- 2) Darius is making a triangular kite with a base of 2.4 metres and a height of 1.8 metres. He wants to decorate half of the kite with blue paper and the other half with red paper. If one sheet of coloured paper covers 0.6 square metres, how many sheets of each colour will he need?





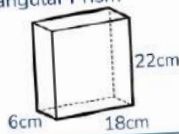
BC Math Curriculum

Measuring Unit – Grade 8

Calculating Surface Area Using Nets

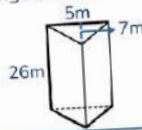
Find the surface area of the 3D shapes below. Type in your answers including the units.

1) Rectangular Prism



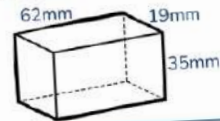
Surface area = _____

2) Triangular Prism



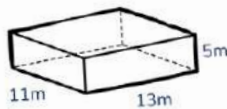
Surface area = _____

3) Rectangular Prism



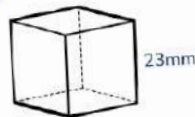
Surface area = _____

4) Rectangular Prism



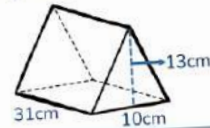
Surface area = _____

5) Cube



Surface area = _____

6) Triangular Prism



Surface area = _____

1) Which shapes make up the net of a cylinder?

- a) Two rectangles and one circle
- b) One rectangle and two circles
- c) Two rectangles and two circles
- d) Three rectangles and one circle

2) In the net of a cylinder, what does the rectangle represent?

- a) The diameter of the base
- b) The circumference of the base and the height of the cylinder
- c) The radius of the base
- d) The volume of the cylinder

3) Which formula gives the surface area of a cylinder?

- a) $2\pi r^2 + \pi rh$
- b) $2\pi rh$
- c) $2\pi r^2 + 2\pi rh$
- d) $\pi r^2 h$

Estimate the circumference of the circle.

1)



Radius	Diameter
Circumference	

2)



Circumference

3)



Radius	Diameter
Circumference	

4)



Radius	Diameter
Circumference	



BC Math Curriculum

Measuring Unit – Grade 8

Calculating Area of a Circle - Circumference

Calculate the area of the circles using the radius.

Calculating Radius From Circumference
 $r = \frac{C}{\pi} \div 2$

Calculating Area Using Radius
 $a = \pi r^2$

#	Circumference	Radius	Area
1)	6 mm		
2)	18 cm		
3)	24 km		
4)	33 cm		
5)	49 m		

#	Circumference	Radius	Area
6)	52 mm		
7)	61 km		
8)	77 m		
9)	84 cm		
10)	98 mm		

1 2 3 4 5 6 7 8 9 0. ^{2 3} cm mm m km

Semi

Fill in the blanks below.

#	Diagram	Area	Perimeter
1)			
2)			
3)			
4)			
5)			
6)			

cm mm m km 1 2 3 4 5 6 7 8 9 0

#	Diagram	Area of Base	Height	Volume
1)				
2)				
3)				
4)				
5)				
6)				

7 8 9 0



Workbook Preview



Grade 8

Measurement and Geometry

	Curriculum Expectations	Pages
MG.1	Surface area and volume of regular solids,	
MG.2		
MG.3	Construction, views, and nets of 3D objects	95 - 148

**Preview of 100 pages from
this product that contains
272 pages total.**

Name: _____

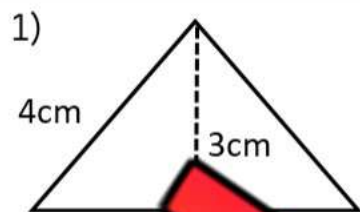
6

Curriculum Connection
MG.1

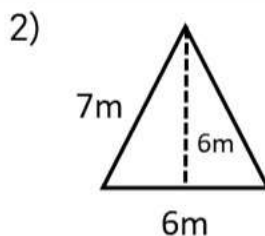
Area of a Triangle

Instruction

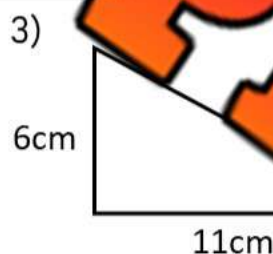
Find the area of the triangles below ($A = b \times h \div 2$)



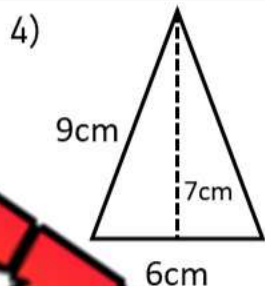
Area = _____



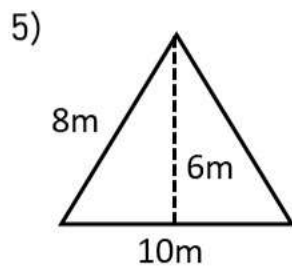
Area = _____



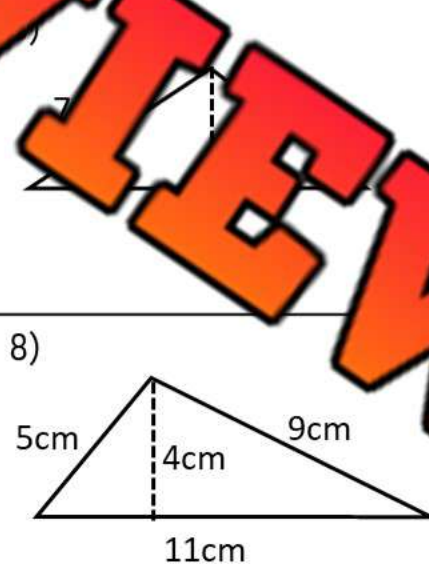
Area = _____



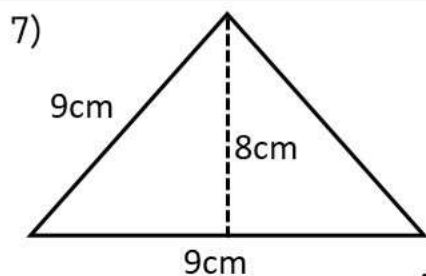
Area = _____



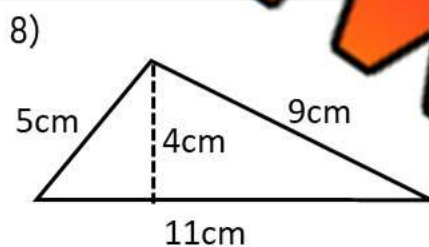
Area = _____



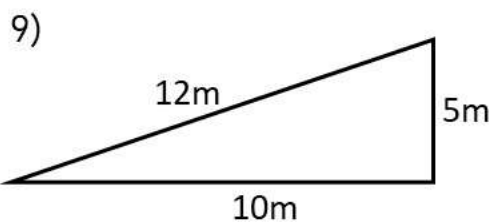
Area = _____



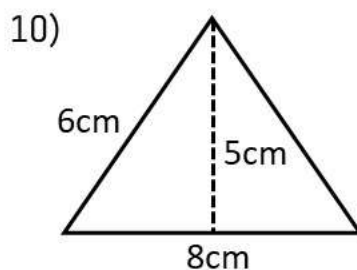
Area = _____



Area = _____



Area = _____



Area = _____

Name: _____

7

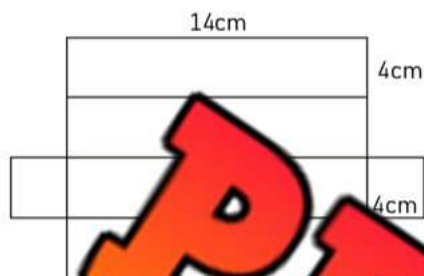
Curriculum Connection
MG.1

Surface Area Using Nets – Rectangular Prisms

Instruction

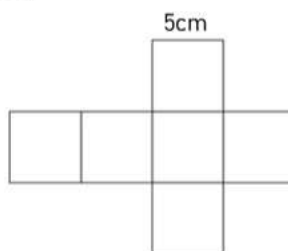
Find the surface area of the 3D objects using the nets below

1)



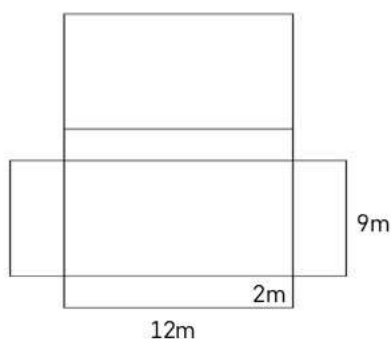
Surface Area: _____

2)



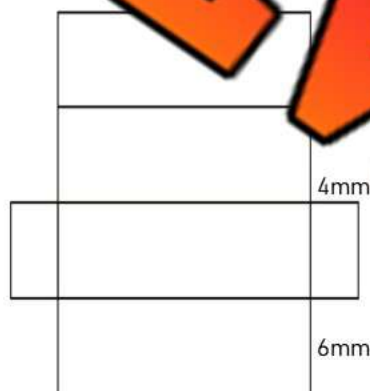
Surface Area: _____

3)



Surface Area: _____

4)



Surface Area: _____

Name: _____

9

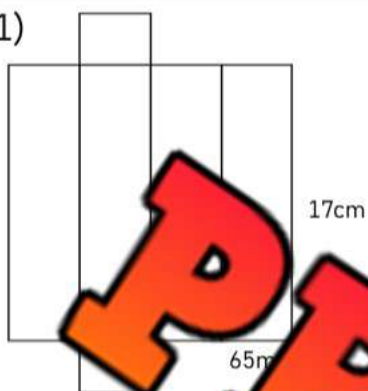
Curriculum Connection
MG.1

Surface Area Using Nets – Rectangular Prisms

Instruction

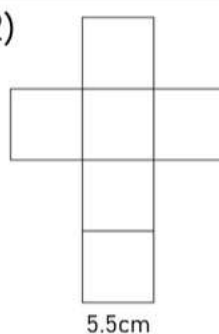
Find the surface area of the 3D objects using the nets below

1)



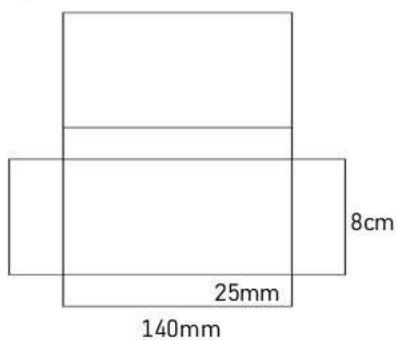
Surface Area: _____

2)



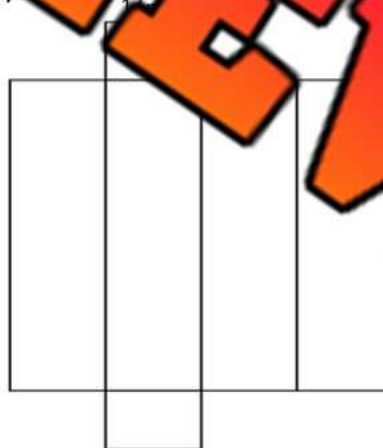
Surface Area: _____

3)



Surface Area: _____

4)



Surface Area: _____

Name: _____

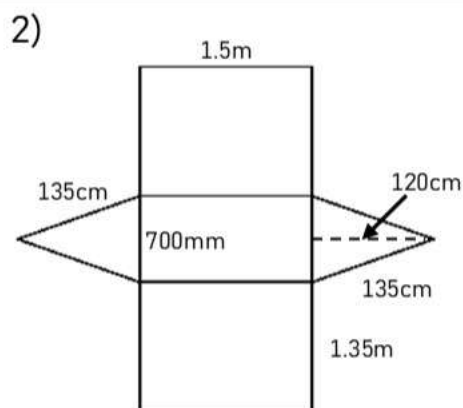
10

Curriculum Connection
MG.1

Surface Area Using Nets – Triangular Prisms

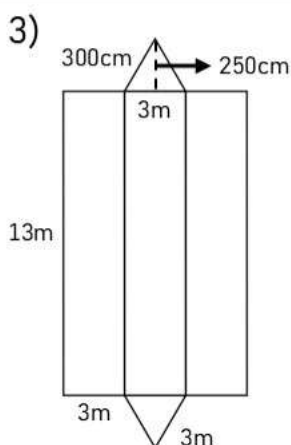
Instruction

Find the surface area of the 3D objects using the nets below

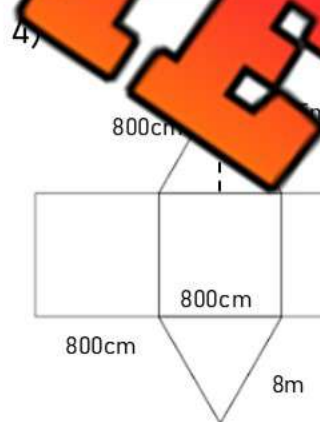


Surface Area: _____

Surface Area: _____



Surface Area: _____



Surface Area: _____

Name: _____

11

Curriculum Connection
MG.1

Surface Area Using Nets – Rectangular Prisms

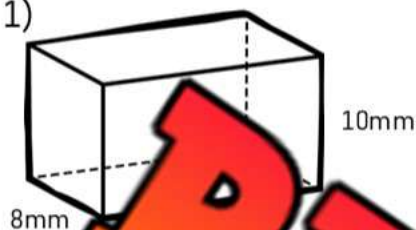
Instruction

Find the surface area of the 3D objects below

Workspace

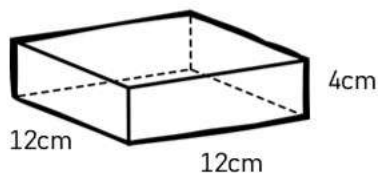
Draw the Net

1)



Surface Area: _____

2)



Surface Area: _____

Exit Cards

Cut Out Cut out the exit cards below and have students complete them at the end of class

Cut out the exit cards below and have students complete them at the end of class

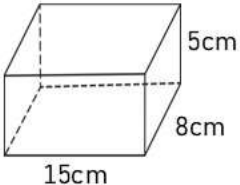
Name: _____

Find the surface area of the 3D objects & draw the net of the rectangular prism.

Workspace	Draw the Net
 Surface Area: _____	

Name: _____

Find the surface area of the 3D objects & draw the net of each one.

Workspace	Draw the
 15cm 8cm 5cm Surface Area: _____	

Name: _____

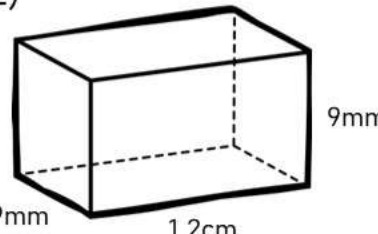
13

Curriculum Connection
MG.1

Surface Area Using Nets – Rectangular Prisms

Instruction

Find the surface area of the 3D objects below

Workspace	Draw the Net
1)  7.5cm 2cm Surface Area: _____	
2)  9mm 1.2cm 9mm Surface Area: _____	

Name: _____

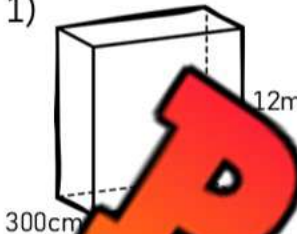
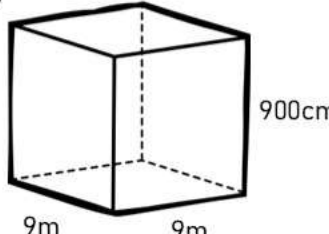
14

Curriculum Connection
MG.1

Surface Area Using Nets – Rectangular Prisms

Instruction

Find the surface area of the 3D objects below

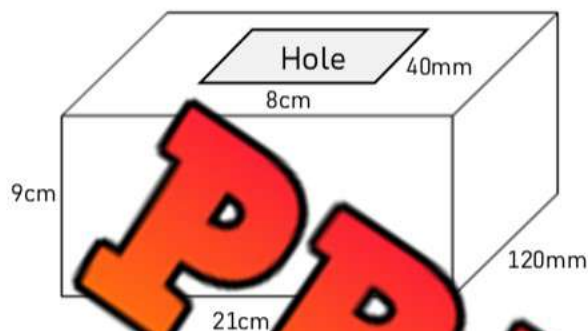
Workspace	Draw the Net
1)  Surface Area: _____	
2)  Surface Area: _____	

Surface Area – Prism – Word Problems

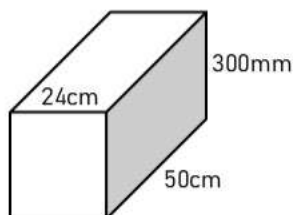
Instruction

Solve the word problems below

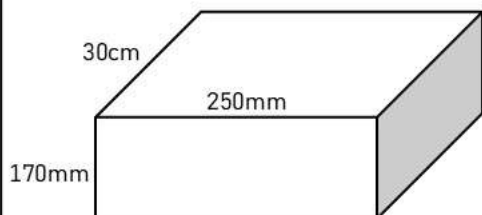
- 1) Find the surface area of the tissue box below.



- 2) Edward is painting his mailbox. He needs to find the surface area so he can buy the amount of paint. The new mailbox has no door on the front. Find the surface area of the mailbox in the diagram below.



- 3) Kaitlyn needs to wrap her mom's birthday present. She has enough wrapping paper to cover a surface area of 3500cm^2 . Does she have enough paper?



Surface Area – Prism – Word Problems

Instruction

Solve the questions below

Lisa is planning to lay bricks on her outdoor fireplace. Her fireplace is a rectangular prism, and she wants to brick all sides, except the bottom.

- a) What is the surface area of the fireplace, excluding the bottom?



- b) What is the surface area of the fireplace (excluding the bottom) in cm?

- c) If the surface area of each brick is 500cm^2 , how many bricks will it need to cover her fireplace (excluding the bottom)?



- d) If each brick costs \$0.79, how much will it cost to cover the fireplace?

Calculating Radius and Diameter

Calculating Radius Formula

$$r = \frac{d}{2} \quad \text{or} \quad r = d \div 2$$

Calculating Diameter Formula

$$d = 2r \quad \text{or} \quad d = r \times 2$$

Instruction

Find the radius and diameter of each circle below

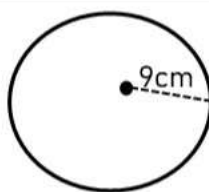
1)



Radius = _____

Diameter = _____

2)



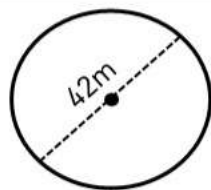
3)



Radius = _____

Diameter = _____

4)



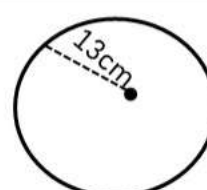
Radius = _____

Diameter = _____

5)



6)



Radius = _____

Diameter = _____

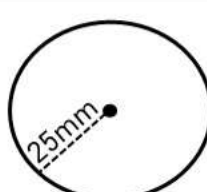
7)



Radius = _____

Diameter = _____

8)



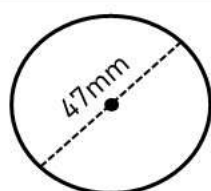
9)



Radius = _____

Diameter = _____

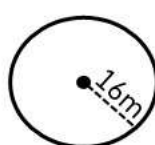
10)



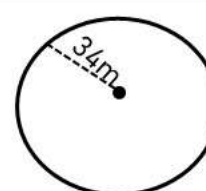
Radius = _____

Diameter = _____

11)



12)



Radius = _____

Diameter = _____

Calculating Circumference

The circumference of a circle is slightly more than 3 times the length of the diameter, or a little more than 6 times the length of the radius. When we need to calculate the circumference of a circle more precisely, we use pi (π). Pi is equal to approximately 3.14, but it is an irrational number, meaning it never ends!



Calculating Circumference (Diameter)

$$c = \pi d \quad \text{or} \quad c = \pi \times d$$

Calculating Circumference (Radius)

$$c = 2\pi r \quad \text{or} \quad c = 2 \times \pi \times r$$

Practice Calculate the circumference of the circles below

1)

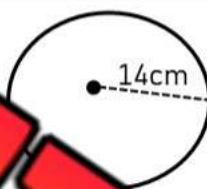


Radius = _____

Diameter = _____

Circumference = _____

2)



Radius = _____

Diameter = _____

Circumference = _____

3)

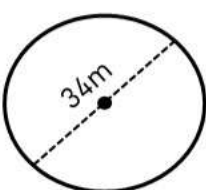


Radius = _____

Diameter = _____

Circumference = _____

4)



Radius = _____

Diameter = _____

Circumference = _____

5)



Radius = _____

Diameter = _____

Circumference = _____

6)



Radius = _____

Diameter = _____

Circumference = _____

7)

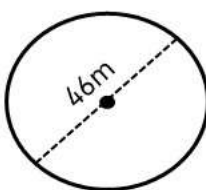


Radius = _____

Diameter = _____

Circumference = _____

8)

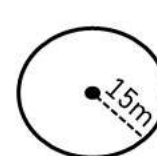


Radius = _____

Diameter = _____

Circumference = _____

9)



Radius = _____

Diameter = _____

Circumference = _____

Calculating Circumference

Calculating Circumference (Diameter)

$$c = \pi d \quad \text{or} \quad c = \pi \times d$$

Calculating Circumference (Radius)

$$c = 2\pi r \quad \text{or} \quad c = 2 \times \pi \times r$$

Part 1

Fill in the table with the missing information

	Radius	Diameter	Circumference
1)	8cm		
2)	1		
3)		25m	
4)		48cm	
5)	21		
6)			
7)	3.8km		
8)	8.5m		
9)		1	
10)		54.8m	

Part 2

Answer the word problems below

1)	Aiden is deciding which pizza to buy. He has two options. <u>Option A:</u> Pizza with a radius of 22cm <u>Option B:</u> Pizza with a circumference of 136cm Which pizza is larger?		
2)	You need to wrap a label around a can. If the diameter of the can is 11.5cm, what length does the label need to be?		
3)	Alexa needs to wrap a cake she made with a ribbon. The cake has a radius of 16.25cm. How long does the ribbon need to be?		

Exit Cards

Cut Out

Cut out the exit cards below and have students complete them at the end of class

Name: _____

1) Fill in the table with the missing information. ($c = \pi d$ & $c = 2\pi r$)

	Radius	Diameter	Circumference
1)	13m		
2)		39m	
3)	11m		
4)		77m	

2) A circular garden has a radius of 7.5 m. You want to put a fence around the entire garden. How long does the fence need to be?

Name: _____

1) Fill in the table with the missing information. ($c = \pi d$ & $c = 2\pi r$)

	Radius	Diameter	Circumference
1)	13m		
2)		39m	
3)	11m		
4)		77m	

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1) Fill in the table with the missing information. ($c = \pi d$ & $c = 2\pi r$)

	Radius	Diameter	Circumference
1)	13m		
2)		39m	
3)	11m		
4)		77m	

2) A circular garden has a radius of 7.5 m. You want to put a fence around the entire garden. How long does the fence need to be?

Name: _____

1) Fill in the table with the missing information. ($c = \pi d$ & $c = 2\pi r$)

	Radius	Diameter	Circumference
1)	13m		
2)		39m	
3)	11m		
4)		77m	

2) A circular garden has a radius of 7.5 m. You want to put a fence around the entire garden. How long does the fence need to be?

Area of a Circle - Radius

The area of a circle is the part inside the circle. We can calculate the area of a circle by using its radius. For most calculations, we can use 3.14 for pi. The formula is $\pi \times \text{radius}^2$. We can write this as $a = \pi r^2$

Calculating Area Using Radius



$$a = \pi r^2$$
$$a = \pi \times 8 \times 8$$
$$a = 200.96\text{m}^2$$

Practice

Calculate the area of the circles using the radius

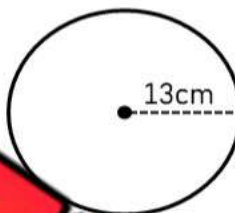
1)



Radius = _____

Area = _____

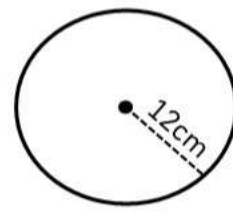
2)



Radius = _____

Area = _____

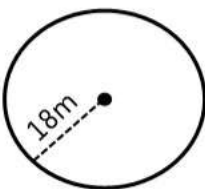
3)



Radius = _____

Area = _____

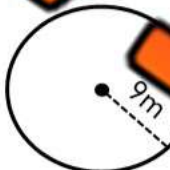
4)



Radius = _____

Area = _____

5)



Radius = _____

Area = _____

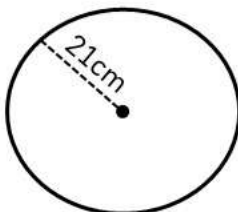
6)



Radius = _____

Area = _____

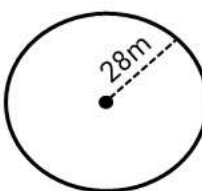
7)



Radius = _____

Area = _____

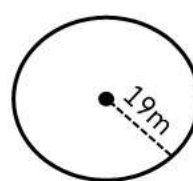
8)



Radius = _____

Area = _____

9)



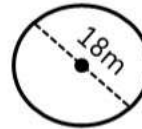
Radius = _____

Area = _____

Area of a Circle - Diameter

When we know the diameter of a circle, we can divide it by two to get the radius. Once we have the radius, we can use it to calculate the area of a circle using the formula: $a = \pi r^2$

Calculating Area Using Diameter



$$a = \pi r^2$$

$$\text{diameter} = 18, \text{radius} = 9$$

$$a = \pi \times 9 \times 9$$

$$a = 254.34\text{m}^2$$

Practice

Calculate the area of the circles using the radius

1)

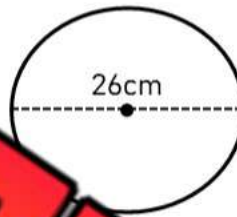


Diameter = _____

Radius = _____

Area = _____

2)

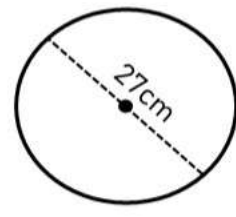


Diameter = _____

Radius = _____

Area = _____

3)

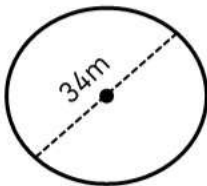


Diameter = _____

Radius = _____

Area = _____

4)

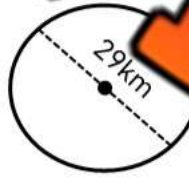


Diameter = _____

Radius = _____

Area = _____

5)

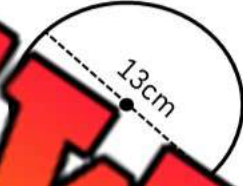


Diameter = _____

Radius = _____

Area = _____

6)



Diameter = _____

Radius = _____

Area = _____

Word Problems

Solve the problems below



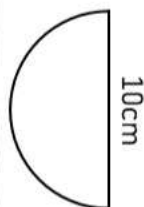
	Questions	Answer
1)	A dinner plate has a diameter of 19cm. What is the area of the plate?	
2)	A circular table is 1.3 metres wide. What is the area of the table in centimetres?	

Semi-Circles

A semi-circle is half of a circle. If we can find the area of a full-circle, we can divide it by two to find the area of a semi-circle.

Calculating Circumference

$$c = \pi d \text{ or } c = 2\pi r$$



Calculating Area of Semi-Circle

$$a = \pi r^2 \div 2$$

diameter = 10, radius = 5

$$a = 3.14 \times 5 \times 5 \div 2$$

$$a = 78.5\text{cm}^2 \div 2$$

$$\text{area of semi-circle} = 39.25\text{cm}^2$$

Part 1 Complete the table below

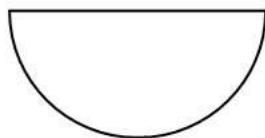
	Diameter	Area of Full Circle	Area of Semi-Circle	Circumference of Full Circle	Circumference of Semi-Circle
1)	7 cm				
2)	5 km				
3)	26 m				
4)	12 mm				
5)	18 m				
6)	33 cm				

Part 2

Calculate the area and perimeter of the semi-circle

1)

13mm



Area = _____

Perimeter = _____

2)

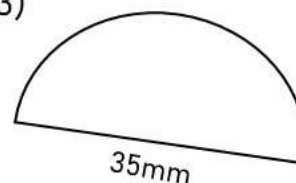


21cm

Area = _____

Perimeter = _____

3)



35mm

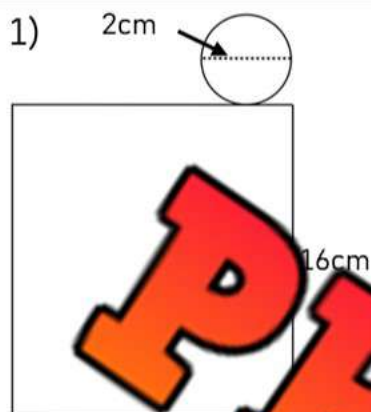
Area = _____

Perimeter = _____

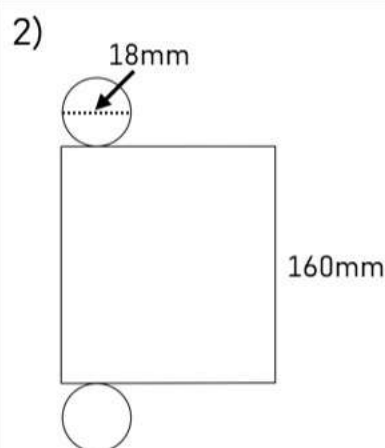
Surface Area Using Nets - Cylinders

Part 1

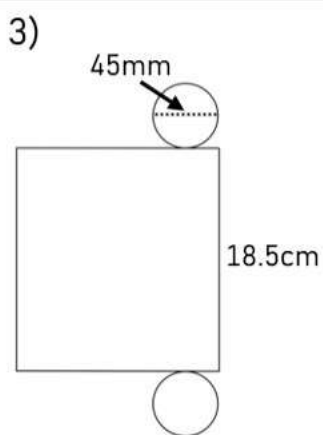
Solve the questions below



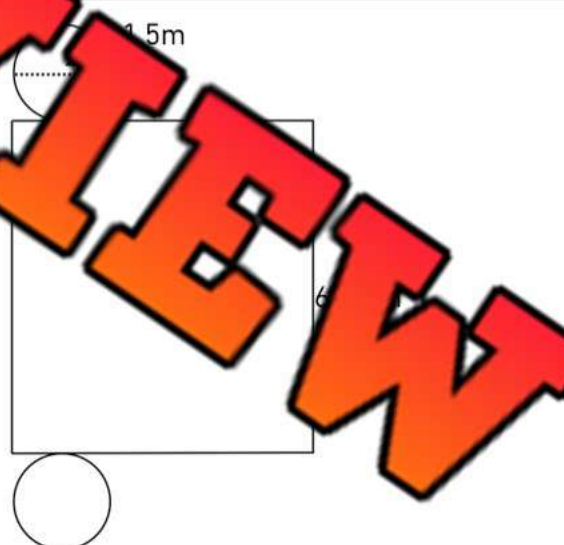
Surface Area: _____



Surface Area: _____



Surface Area: _____



Surface Area: _____

Part 2

Solve the question below

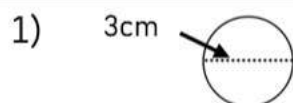
A can is 13cm tall. The top of the can has a radius of 3cm. Draw the net of the can and calculate the surface area of the can.



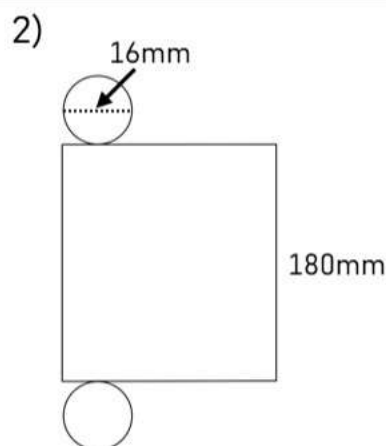
Surface Area Using Nets - Cylinders

Part 1

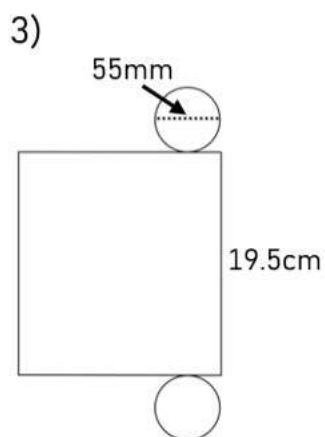
Solve the questions below



Surface Area: _____



Surface Area: _____



Surface Area: _____

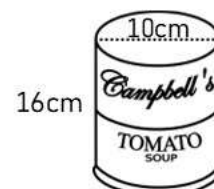


Surface Area: _____

Part 2

Solve the question below

A can of soup has the dimensions shown on the diagram. Draw a net of the can and calculate the surface area of the can.



Surface Area - Cylinders

Instruction

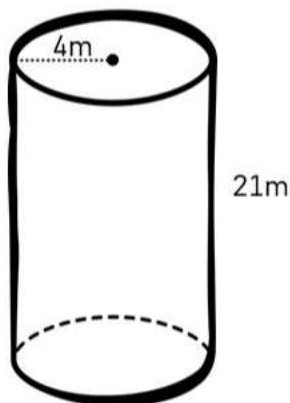
Solve the questions below

1)



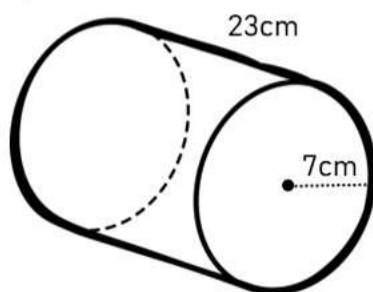
Surface Area: _____

2)



Surface Area: _____

3)



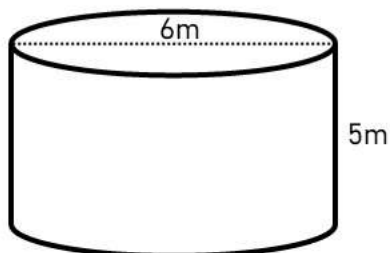
Surface Area: _____

2.5cm



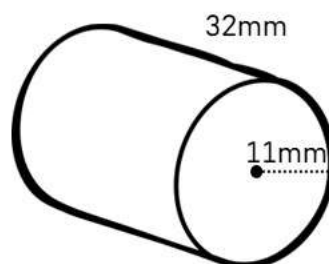
Surface Area: _____

5)



Surface Area: _____

6)



Surface Area: _____

Surface Area - Cylinders

Instruction

Solve the questions below



- 1) A can of soup has a diameter of 9cm and a height of 19cm. What is the surface area of the can?

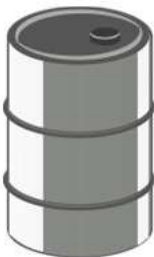


- 2) A can of tuna has a radius of 7.5cm and a height of 42mm. What is the surface area of the can?



- 3) A battery is composed of two cylinders. The main battery cylinder has a radius of 1.5cm. The height of the main cylinder is 8cm. The smaller cylinder on top of the battery has a diameter of 8mm and a height of 4mm.

What is the total surface area of the battery?



- 4) A barrel has a diameter of 74cm and a height of 1.62m. What is the surface area of the barrel?

Exit Cards

Cut Out Cut out the exit cards below and have students complete them at the end of class

Name: _____

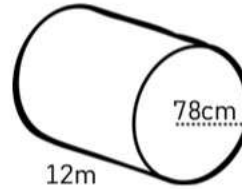
- 1) Find the surface area for the cylinder.
(Surface Area = $2\pi r^2 + 2\pi rh$)



- 2) A water tank is shaped like a cylinder. It has a radius of 2.5 m and a height of 5.5 m. What is the surface area of the tank, including the top and bottom?

Name: _____

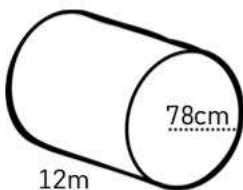
- 1) Find the surface area for the cylinder.
(Surface Area = $2\pi r^2 + 2\pi rh$)



- 2) A water tank is shaped like a cylinder. It has a radius of 2.5 m and a height of 5.5 m. What is the surface area of the tank, including the top and bottom?

Name: _____

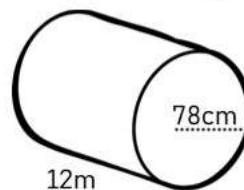
- 1) Find the surface area for the cylinder.
(Surface Area = $2\pi r^2 + 2\pi rh$)



- 2) A water tank is shaped like a cylinder. It has a radius of 2.5 m and a height of 5.5 m. What is the surface area of the tank, including the top and bottom?

Name: _____

- 1) Find the surface area for the cylinder.
(Surface Area = $2\pi r^2 + 2\pi rh$)



- 2) A water tank is shaped like a cylinder. It has a radius of 2.5 m and a height of 5.5 m. What is the surface area of the tank, including the top and bottom?

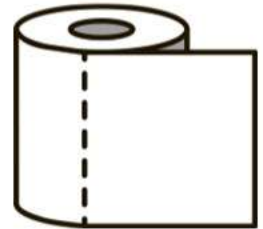
Surfaces Area Using Nets - Cylinders

Instruction

Solve the questions below

1) A toilet paper roll is 16cm tall with a radius of 6cm. The inside cylinder is a hole. It has a diameter of 3cm.

What is the surface area of the toilet paper roll. Remember to account for the hole.



2) A wheel of brie cheese is 16cm tall. The wheel is 9cm long. What is the surface area of the full wheel of cheese?



3) A pot has no lid on top. The pot is 14cm tall and has a radius of 10cm. What is the surface area of the pot?



Calculating Volume Using the Base

Instruction

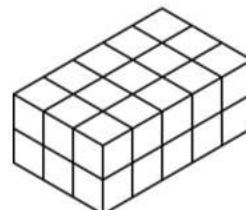
Fill in the blanks to investigate the area of the base and the height

1)

Area of BaseVolume

18

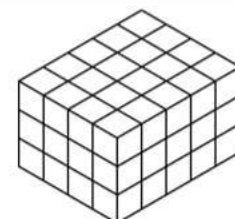
2)

Area of BaseHeightVolume

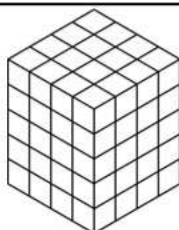
3)

Area of BaseHeightVolume

4)

Area of BaseHeightVolume

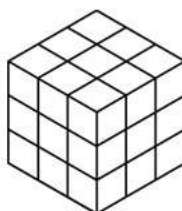
5)

Area of BaseHeightVolume

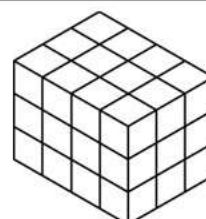
6)

Area of BaseHeightVolume

7)

Area of BaseHeightVolume

8)

Area of BaseHeightVolume

Calculating Volume Using the Base

Part 1

Fill in the blanks to investigate the area of the base and the height

	Area of Base	Height	Volume
1)	10 cm^2		80 cm^3
2)	13 mm^2	6 mm	
3)		5 cm	75 cm^3
4)		8 mm	96 mm^3
5)		9 m	
6)	16 m^2		144 mm^3
7)			132 km^3
8)	15 m^2		210 m^3

Part 2

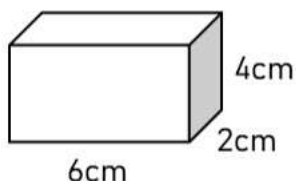
Answer the questions below

1)	A box of cereal has a base with a length of 12cm and a width of 9cm. The height of the box is 22cm. What is the volume of the box?	
2)	A juice box is 9cm wide and 5cm long. The height of the juice box is 12cm. What is the volume of the juice box?	
3)	A railway car is 6.5m long and 2.2m wide. The railway car is 3.1m tall. What is the volume of the railway car?	

Calculating Volume of Rectangular Prisms

Rectangular Prism - Calculating Volume

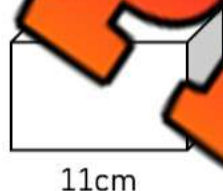
To find the volume of a rectangular prism, multiply the length by the width by the height.



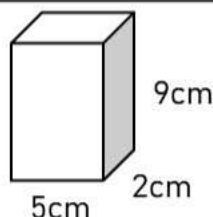
$$v = l \times w \times h$$
$$v = 6\text{cm} \times 2\text{cm} \times 4\text{cm}$$
$$v = 48\text{cm}^3$$

Instruction Calculate the volume of the rectangular prisms

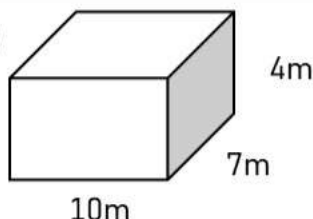
1)



2)



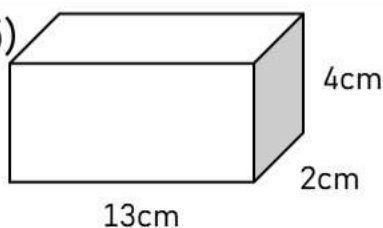
3)



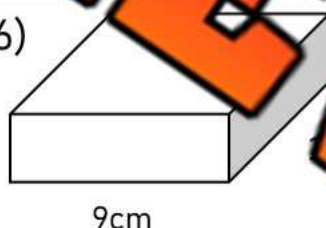
4)



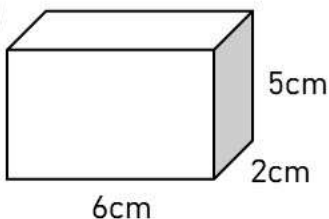
5)



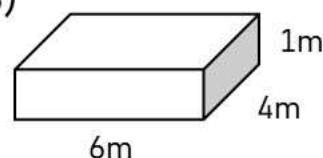
6)



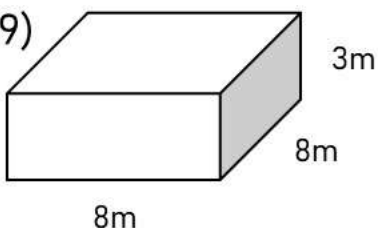
7)



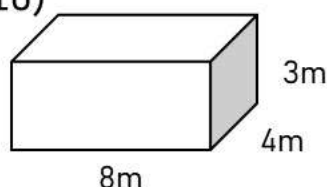
8)



9)



10)



Calculating Volume of Rectangular Prisms

Instruction

Solve the word problems below

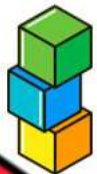
1) A classroom has a width of 12m, height of 2m, and a length of 10m. What is the volume of the classroom?



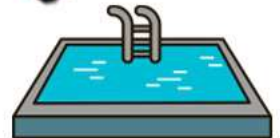
2) An elevator is 2m deep, and 4m long. What is the volume of the elevator?



3) A block has a height of 7cm, width of 60mm, and a length of 10cm. What is the volume of the block?



4) A pool is 9m long, 6m wide, and 300cm deep. What is the volume of the pool?



5) A lunchbox is 120mm wide, 7cm tall, and 10cm deep. What is the volume of the lunchbox?



Exit Cards

Cut Out Cut out the exit cards below and have students complete them at the end of class

Name: _____

1) Label the rectangular prism and calculate the volume.

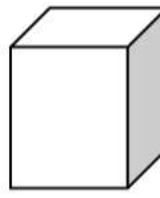


$l = 2.7\text{cm}$
 $w = 7\text{mm}$
 $h = 12\text{cm}$

2) A fish tank is 1 m long, 50 cm wide, and 40 cm high. What is the volume of the fish tank?

Name: _____

1) Label the rectangular prism and calculate the volume.



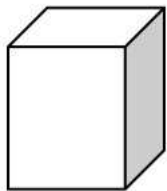
$l = 2.7\text{cm}$
 $w = 7\text{mm}$
 $h = 12\text{cm}$

$V =$ _____

2) A fish tank is 1 m long, 50 cm wide, and 40 cm high. What is the volume of the fish tank?

Name: _____

1) Label the rectangular prism and calculate the volume.



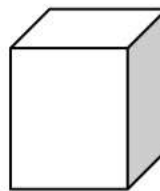
$l = 2.7\text{cm}$
 $w = 7\text{mm}$
 $h = 12\text{cm}$

$V =$ _____

2) A fish tank is 1 m long, 50 cm wide, and 40 cm high. What is the volume of the fish tank?

Name: _____

1) Label the rectangular prism and calculate the volume.



$l = 2.7\text{cm}$
 $w = 7\text{mm}$
 $h = 12\text{cm}$

$V =$ _____

2) A fish tank is 1 m long, 50 cm wide, and 40 cm high. What is the volume of the fish tank?

Scavenger Hunt: Volume of Rectangular Prisms

Objective

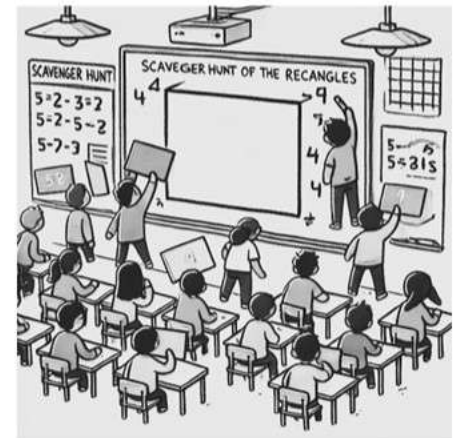
What are we learning about?

Students will practice calculating the volume of rectangular prisms, enhancing their understanding of this geometric concept through a fun and engaging scavenger hunt.

Materials

What you will need for the activity.

- Small index cards with volume questions (provided)
- Small bags or envelopes for each team to collect their cards
- Tape to hide cards around the classroom or in a designated safe outdoor area



Instructions

How you will implement the activity.

- 1) **Prepare the Cards:** Write volume questions and correct answers on index cards. Use the questions generated above.
- 2) **Hide the Cards:** Hide the cards around the classroom or in a designated safe outdoor area. Tape them under chairs, desks, or on the wall into obvious spots.
- 3) **Divide into Teams:** Divide the class into small teams and give each team a bag or envelope to collect their cards.
- 4) **Explain the Game:** Explain the game to the students. Each team will search for a card, solve the problem on it as quickly as they can, and return to you for verification.
- 5) **Start the Game:** Say "Go!" and each team rushes to find their first card.
- 6) **Verify Answers:** When a team thinks they have the correct answer, they come back to you. If correct, they receive a checkmark and move on to find the next card.
- 7) **Continue Playing:** The game continues until all cards are found or you call time. The team with the most correct answers wins.
- 8) **Discuss:** After the game, discuss the problems and solutions each team encountered, focusing on the methods used to calculate the volume.

Index cards

Cut out the cards below

A room has dimensions of 6 m by 5 m by 3 m. What is the volume of the room in cubic meters?

A fish tank measures 80 cm by 30 cm by 45 cm. Calculate the volume of the tank.

A metal block has dimensions of 25 cm by 10 cm by 5 cm. What is its volume in cubic centimeters?

The volume of a storage unit is 32 cubic meters. Its length is 4 m, and its width is 2 m. What is the height of the unit?

A package has a length of 60 cm, a width of 40 cm, and a height of 20 cm. What is the volume of the package?

A sandpit is 2 m by 1.5 m by 0.4 m. Calculate the volume of sand it can hold.

A rectangular box has dimensions of 50 cm by 35 cm by 15 cm. What is the volume in cubic centimeters?

A container has a length of 1.2 m, a width of 0.8 m, and a height of 0.5 m. Find the volume of the container.

Index cards

Cut out the cards below

A rectangular box has a length of 12 cm, a width of 8 cm, and a height of 5 cm. What is the volume of the box?

The dimensions of a bookcase are 2 m by 1 m by 2.5 m. Calculate the volume of the bookcase.

A storage unit is 1.5 m long, 0.8 m wide, and 2.8 m high. Calculate the volume of the storage unit.

A rectangular swimming pool measures 25 m in length, 10 m in width, and 2 m in depth. Find the volume of the pool.

A rectangular prism has a width of 5 cm, a length of 10 cm, and a height of 20 cm. What is its volume?

The dimensions of a rectangular island are 3 m by 2 m by 1 m. Calculate the volume of the island.

A toy box measures 60 cm in length, 45 cm in width, and 35 cm in height. Find the volume of the toy box.

A warehouse has a storage bin that is 8 m long, 4 m wide, and 3 m high. What is the volume of the bin?

Index cards

Cut out the cards below

A refrigerator has a width of 0.7 m, a depth of 0.6 m, and a height of 1.8 m. Calculate the volume of the refrigerator.

A truck container has dimensions of 12 m by 3 m by 4 m. What is the volume of the container?

A brick has dimensions of 12 cm by 6 cm by 4 cm. Calculate the volume of the brick in cubic centimeters.

The volume of a rectangular prism is 96 cubic meters. The length is 8 m and the width is 4 m. What is the height?

A cereal box has a length of 30 cm, a width of 8 cm, and a height of 25 cm. What is the volume of the box?

A room has a length of 4 m, a width of 3 m, and a height of 2.5 m. Calculate the volume of the room.

A fish tank has a length of 50 cm, a width of 20 cm, and a height of 30 cm. What is the volume of the fish tank?

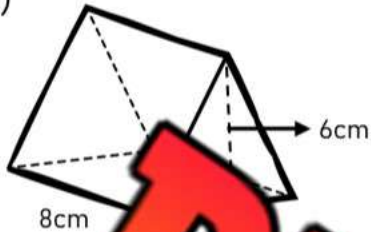
A storage crate has dimensions of 6 m by 2.5 m by 2 m. What is the volume of the crate?

Volume – Triangular Prisms

Instruction

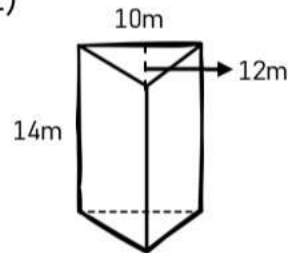
Find the volume of the triangular prisms below

1)



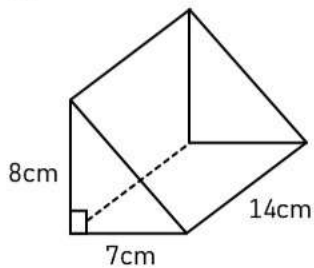
Volume: _____

2)

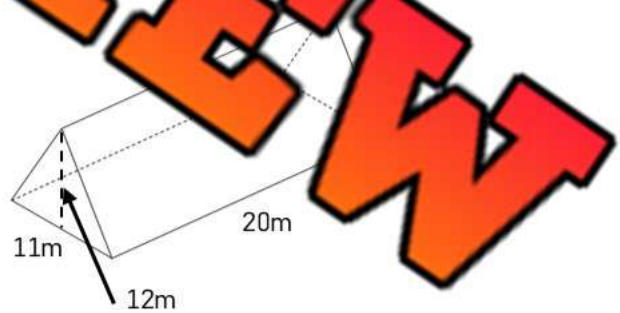


Volume: _____

3)



Volume: _____



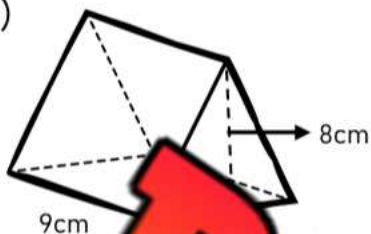
Volume: _____

Volume – Triangular Prisms

Instruction

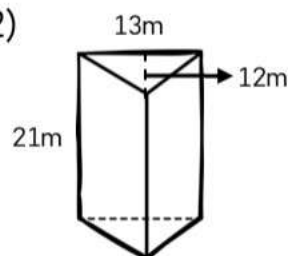
Find the volume of the triangular prisms below

1)



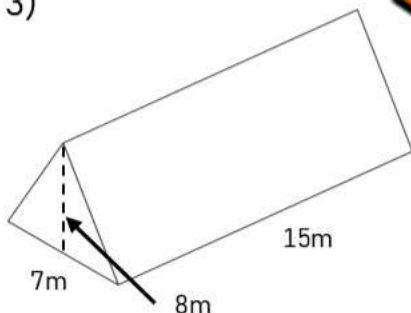
Volume: _____

2)



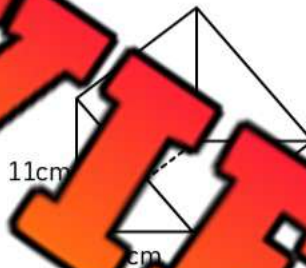
Volume: _____

3)



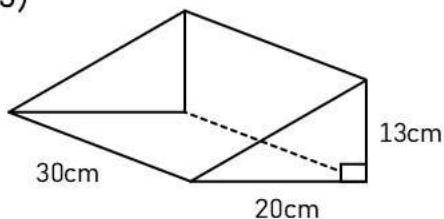
Volume: _____

4)



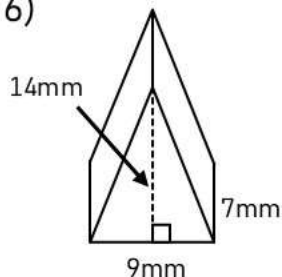
Volume: _____

5)



Volume: _____

6)

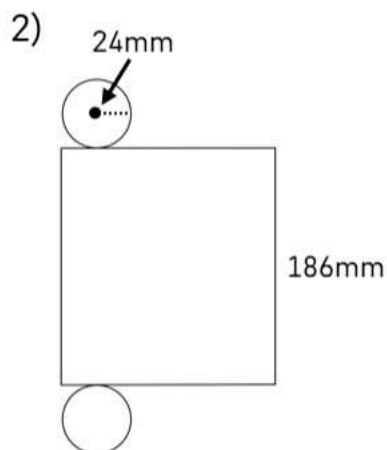


Volume: _____

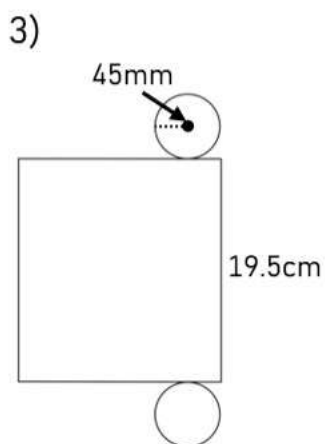
Volume - Cylinders

Part 1

Solve the questions below



Area of the Base: _____ Volume: _____



Area of the Base: _____ Volume: _____

Part 2

Solve the question below

A paint can is 54cm tall and has a diameter of 18cm. What is the volume of the paint can?



Name: _____

54

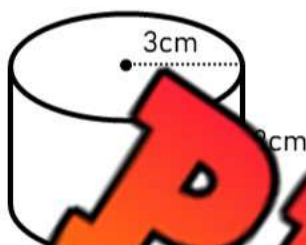
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Volume - Cylinders

Instruction

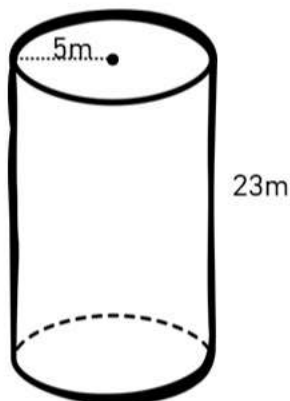
Solve the questions below

1)



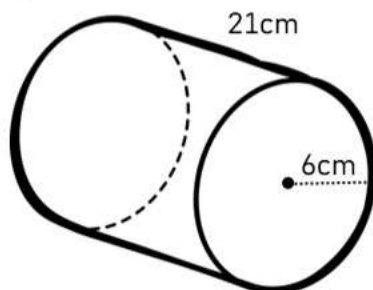
Area of the Base: _____ Volume: _____

2)



Area of the Base: _____ Volume: _____

3)



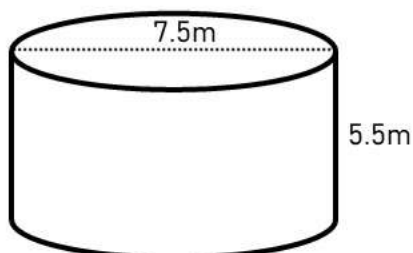
Area of the Base: _____ Volume: _____

4)



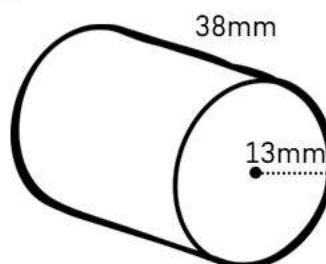
Area of the Base: _____ Volume: _____

5)



Area of the Base: _____ Volume: _____

6)



Area of the Base: _____ Volume: _____

Volume - Cylinders

Part 1

Fill in the blanks to investigate the area of the base and the volume

	Radius	Area of Base	Height	Volume
1)	8 mm		12 mm	
2)	5 mm		18 mm	
3)			9 cm	
4)	3 cm		7 km	
5)	9 cm		7 cm	
6)	12 cm		8 cm	
7)	4 m		13 m	
8)	7 m		11 m	

Part 2

Answer the questions below

1)	The radius of a swimming pool is 3.6 metres. The height of the pool is 1.8 metres. What is the volume of the swimming pool?	
2)	A can's base has an area of 32 cm^2 . The volume of the can is 288 cm^3 . What is the height of the can?	
3)	A bucket has a height of 8cm. The bucket's base has an area of 20 cm^2. a) What is the volume of the bucket? b) If 1 cm^3 of volume has the capacity to hold 1mL of water, how many mL can the bucket hold?	

Exit Cards

Cut Out

Cut out the exit cards below and have students complete them at the end of class

Name: _____

1) Fill in the blanks to investigate the area of the base, height, and the volume.

	Radius	Area of Base	Height	Volume
1)	_____m	_____	10cm	_____
2)	_____	_____	15cm	_____
3)	_____	_____	20cm	392.5cm ³
4)	7cm	154cm ²	_____	924cm ³

2) A cylindrical water tank has a base area of 200 cm² and a height of 2 meters.

- What is the volume of the tank in cubic centimeters (cm³)?
- If 1 liter of water is equal to 1,000 cm³, how many liters of water can the tank hold?

Name: _____

1) Fill in the blanks to investigate the area of the base, height, and the volume.

	Radius	Area of Base	Height	Volume
1)	6cm	_____	10cm	_____
2)	4cm	_____	15cm	_____
3)	2.5cm	_____	20cm	392.5cm ³
4)	7cm	154cm ²	_____	924cm ³

2) A cylindrical water tank has a base area of 200 cm² and a height of 2 meters.

- What is the volume of the water tank in cubic centimeters (cm³)?
- If 1 liter of water is equal to 1,000 cm³, how many liters of water can the tank hold?

Volume of Cylinders

Part 1

Fill in the blanks to investigate the area of the base and the volume

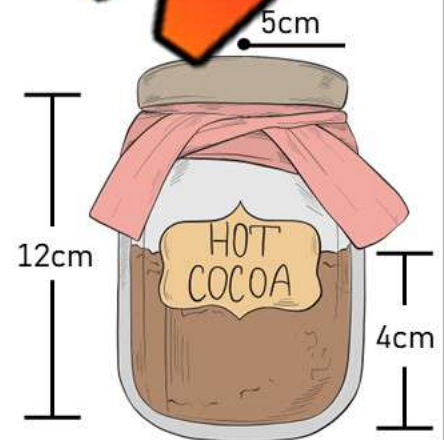
	Area of Base	Height	Volume
1)	8 mm^2	7 mm	
2)	15 cm^2	11 cm	
3)	12 m^2		114 m^3
4)	17 km^2		154 km^3
5)	9 mm^2		119 mm^3
6)	18 m^2	15 m	
7)	22 km^2		
8)	25 mm^2		175 mm^3

Part 2

Answer the questions below

A hot cocoa jar is 12cm tall. There are only 4 cm left of cocoa at the bottom. The radius of the jar is 7cm.

- What is the volume of cocoa left in the jar?
- How much more cocoa would be needed to fill the jar?



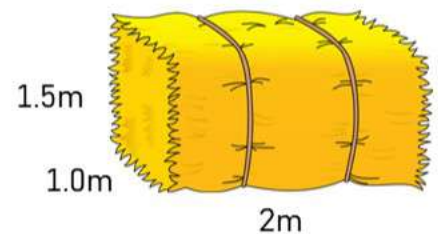
Volume of Cylinders

Instruction

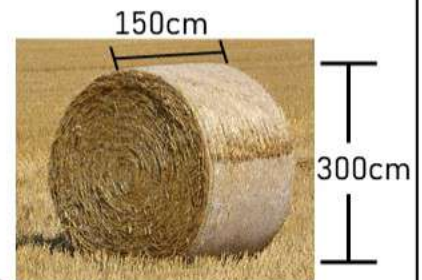
Answer the questions below

1) There are two types of hay bales – one that is in the shape of a cylinder and one that is in the shape of a rectangular prism. The cylinder-shaped hay bale is 300cm tall and 150cm long. The rectangular-shaped hay bale has the following dimensions: 1.5m by 1.0m by 2.0m.

a) Which one of hay bale contains more hay?



b) Joel thinks that one cylinder-shaped hay bale out of 3 rectangular-shaped bales. Is he right? Explain.



2) You are planning to make candles to sell. What would the dimensions of the candles be?

a) Draw a picture of one of the candles and label the dimensions.

b) What is the volume of the candle?

c) For every 10cm^3 , it costs you 30 cents. How much would the candle cost you in total?

Activity: "Cylinder Volume Toss Challenge"

Objective

What are we learning about?

Students will reinforce their understanding of finding the volume of cylinders through a fun, team-based activity that involves answering volume problems and shooting a paper ball into a bin.

Materials

What you will need for the activity.

- Index cards with volume problems
- Recording sheet for each team
- Paper balls (one per team)
- Bins or baskets (one per team)
- Desks (one per team)



Instructions

How you will implement the activity

1. Arrange the classroom so that there is enough space for multiple teams to work simultaneously. Place a desk about 6 feet away from a bin or basket.
2. Place a stack of index cards with area problems on each desk.
3. Provide each team with a recording sheet and a paper ball.
4. Divide the students into teams of about five members.
5. Each team stands in a line behind their respective desk.
6. The first student in line flips over an index card and solves the problem related to the volume of a cylinder on the recording sheet.
7. Once the answer is recorded, the student attempts to shoot the paper ball into the bin.
8. If the student makes the shot, they place a tally mark on the team's tally sheet for a point. If they miss, no tally is given.
9. The student then goes to the end of the line, and the next student steps up to the desk to repeat the process.
10. The activity continues until all index cards have been solved.
11. Once all index cards are completed, the teacher collects the recording sheets and reviews the answers with the class.
12. For each incorrect answer, the team loses one point.
13. The team with the highest number of points after deductions is declared the winner.

Index Cards

Cut out the cards below

A cylinder has a volume of $2\,400\text{ cm}^3$ and a radius of 5 cm. Find the height of the cylinder.

A cylindrical container has a volume of $1\,256\text{ cm}^3$ and a height of 8 cm. Find the radius of the base.

A grain bin has a diameter of 10 m and a height of 12 m. Find the volume of the bin.

A cylindrical soap dispenser has a radius of 6 cm and a height of 20 cm. Find its volume.

A cylinder has a volume of $3\,141\text{ cm}^3$ and a height of 10 cm. Find the radius of the cylinder.

A cylindrical barrel has a radius of 0.75 m and a height of 1.2 m. Find its volume.

A thermos is cylindrical with a diameter of 7 cm and a height of 30 cm. Find the volume.

A fuel drum has a radius of 35 cm and a height of 90 cm. What is the volume of the drum?

Index Cards

Cut out the cards below

A cylindrical flower pot has a radius of 11 cm and a height of 16 cm. Calculate its volume.

A storage cylinder has a volume of $9\,425\text{ cm}^3$ and a radius of 5 cm. Find the height.

A cylindrical container has a radius of 12 m and a height of 10 m. What is its volume?

A cylinder has a volume of $6\,283\text{ cm}^3$ and a height of 20 cm. Find the radius.

A canister has a radius of 8 cm and a height of 40 cm. What is the volume?

A cylindrical container has a diameter of 14 cm and a height of 9 cm. Find the volume.

A cylinder has a volume of $1\,570\text{ cm}^3$ and a radius of 5 cm. Find the height.

A cylindrical mixing bowl has a radius of 18 cm and a height of 10 cm. What is its volume?

Name: _____

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Cylinder Volume Toss Challenge

Answers

Record your answers below

Question	Answer
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	

Question	Answer
13	
14	
15	
16	
17	
18	
19	
20	
21	
22	
23	
24	

Tally Chart

Record your makes in the tally chart below

Tallies – Made Shots	Total

Wrong Answers	Final Score

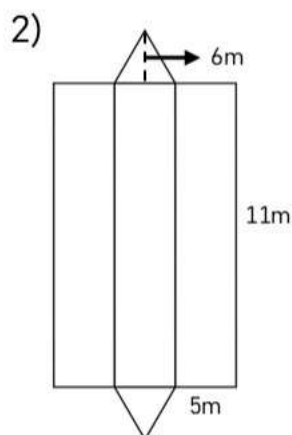
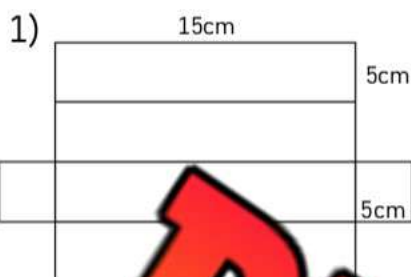
Name: _____

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Unit Test – Surfaces Area and Volume

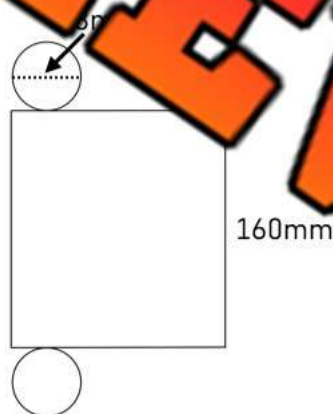
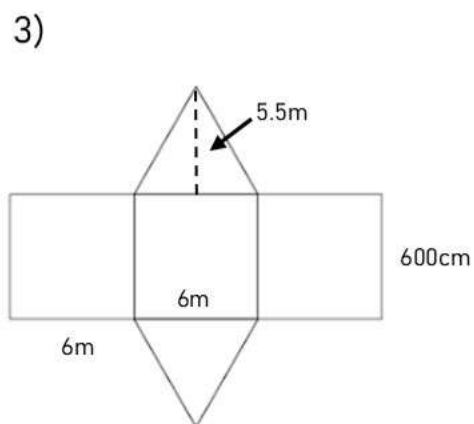
Part 1

Find the surface area of the 3D objects using the nets below



Surface Area: _____

Surface Area: _____



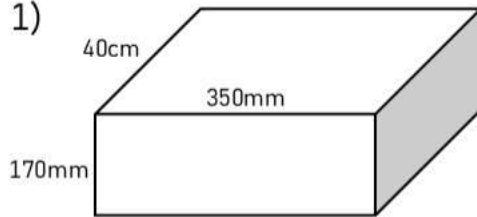
Surface Area: _____

Surface Area: _____

Part 2

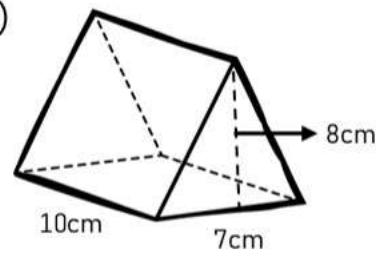
Find the surface area of the objects below

1)



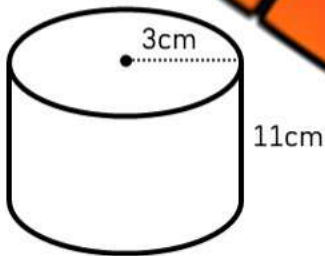
Surface Area: _____

2)



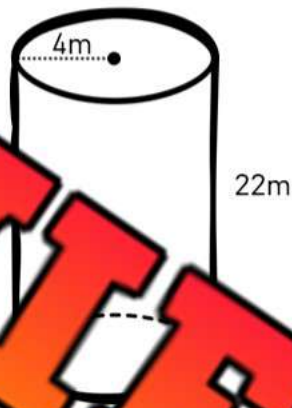
Surface Area: _____

3)



Surface Area: _____

4)



Surface Area: _____

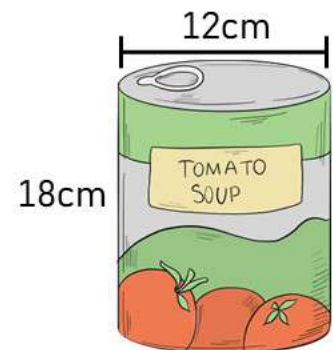
Part 3

Solve the question below

Becky takes the lid off a can of soup. The can's dimensions are labelled on the picture.

a) What is the surface area of the can without the lid?

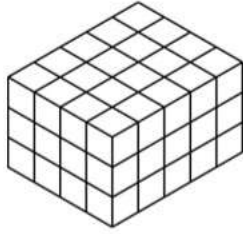
b) What is the surface area of the lid?



Part 4

Fill in the blanks to investigate the area of the base and the volume

1)

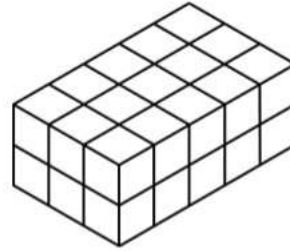


Area of Base

Height

Volume

2)



Area of Base

Height

Volume

Part 5

Fill in the blanks to investigate the area of the base and the volume

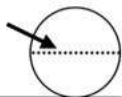
	Area of Base	Height	Volume
1)	11 cm ²		110 cm ³
2)	15 mm ²		
3)		4 cm	96 cm ³
4)		11 mm	132 mm ³

Part 6

Find the area of the base and the volume of the cylinder

1)

2cm



16cm

Area of the Base: _____ Volume: _____

2)

21mm



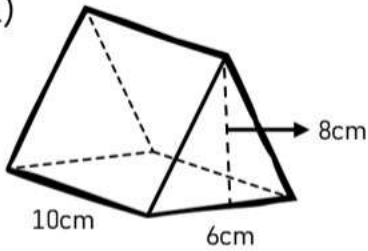
178mm

Area of the Base: _____ Volume: _____

Part 7

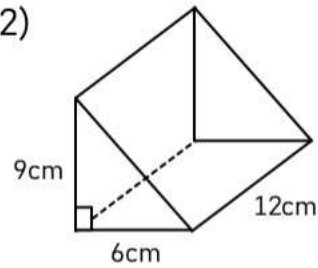
Find the volume of the triangular prisms

1)



Volume: _____

2)



Volume: _____

Part 8

Answer the questions

1)

The radius of a swimming pool is 4.2 metres. The height of the pool is 1.6 metres.

- a) What is the volume of the pool?
- b) If 1cm^3 of volume has the capacity to hold 1 mL of water, how many mL can the pool hold?



2)

A can's base has an area of 37 cm^2 . The volume of the can is 333 cm^3 . What is the height of the can?



3)

A bucket has a height of 17cm. The bucket's base has an area of 16cm^2 . What is the volume of the bucket?

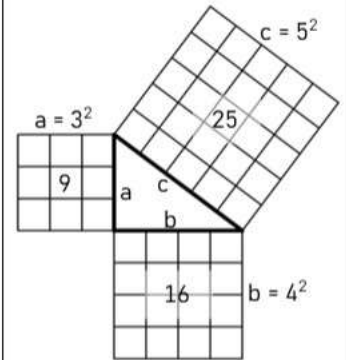


Intro – Pythagorean Theorem

The properties of a right triangle can be used to find an unknown side length. The longest side of a right triangle is always opposite the 90° angle and is called the **hypotenuse**.

The formula for calculating the length of the hypotenuse is: $a^2 + b^2 = c^2$

- If side a is 3 units long, then a square on this side has an area of 3^2 or 9.
- If side b is 4 units long, then a square on this side has an area of 4^2 or 16.
- If the length of side c is equal to the combined areas of the squares on sides a and b , then the square on side c must have an area of 25 square units ($9 + 16$). This means the length of side c must be $\sqrt{25}$.



Part 1

Label the sides of the right triangles: a , b , and c



Part 2

Evaluate

	Question	Answer
1)	3^2	
2)	8^2	
3)	10^2	
4)	$\sqrt{36}$	

	Question	Answer
5)	$\sqrt{144}$	
6)	$\sqrt{16}$	
7)	7^2	
8)	$\sqrt{81}$	

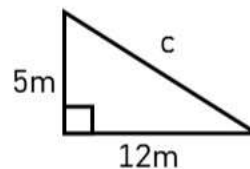
Part 3

Label the triangles: a , b , c and fill in the blanks to find their values

1) $a^2 + b^2 = c^2$ _____ + _____ = _____ Hypotenuse = _____	2) $a^2 + b^2 = c^2$ _____ + _____ = _____ Hypotenuse = _____
--	--

Pythagorean Theorem – Missing Side

The most common use of the Pythagorean Theorem is to find the value of a side on a right-triangle. We do this by applying our understanding of simplifying algebraic equations. To find the value of the hypotenuse, simply plug the values into the equation.



Solution

$$a^2 + b^2 = c^2$$
$$5^2 + 12^2 = c^2$$
$$25 + 144 = c^2$$
$$\sqrt{169} = \sqrt{c^2}$$
$$13 = c$$

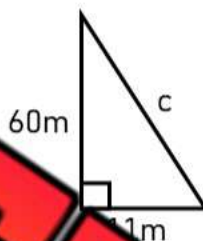
Instruction

Find the value of the hypotenuse

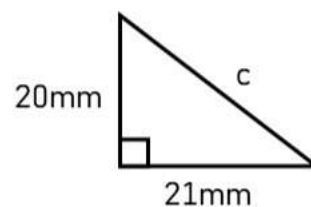
1)



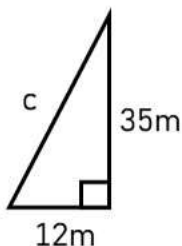
2)



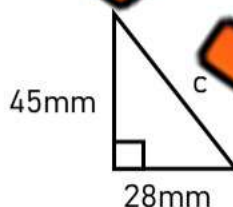
3)



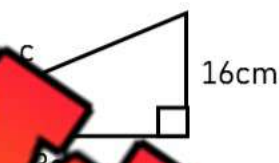
4)



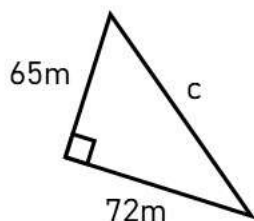
5)



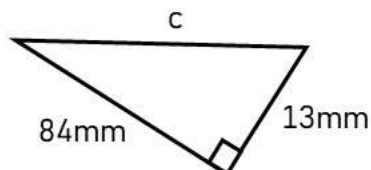
6)



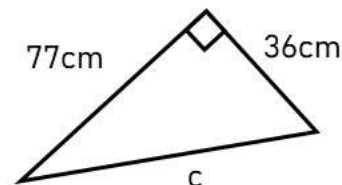
7)



8)



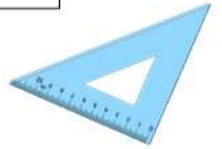
9)



Pythagorean Theorem – Word Problems

Instructions

Answer the questions below



1)

In a right-angled triangle, the lengths of the two shorter sides are 3 cm and 4 cm. What is the length of the hypotenuse?

2)

A right triangle has one leg that measures 8 meters and another leg that measures 6 meters. What is the length of the hypotenuse?

3)

A building is 30 meters tall, and a ladder is leaning against the top of the building. If the base of the ladder is 25 metres away from the building, how long is the ladder?

4)

A rectangular billboard is 15 meters tall and 20 meters wide. A diagonal pole runs from the bottom corner to the top corner. How long is the pole?

5)

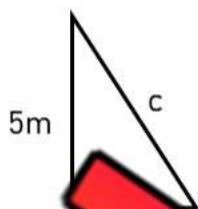
A rectangular garden is 12 meters long and 8 meters wide. If a diagonal path is drawn across the garden, what is the length of the path?

Pythagorean Theorem – Missing Side

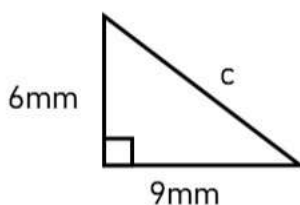
Instructions

Find the value of the hypotenuse. Round the answer to the nearest tenth

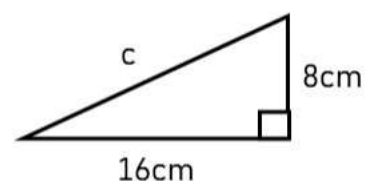
1)



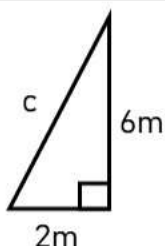
2)



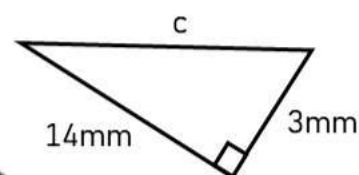
3)



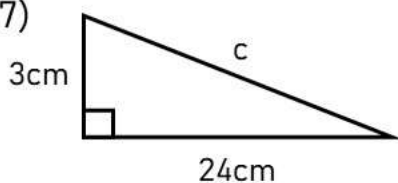
4)



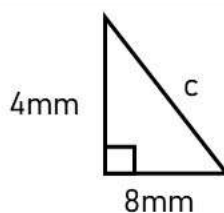
6)



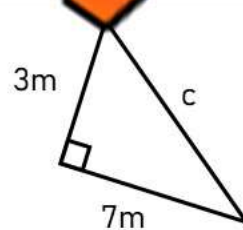
7)



8)



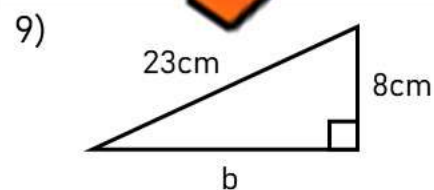
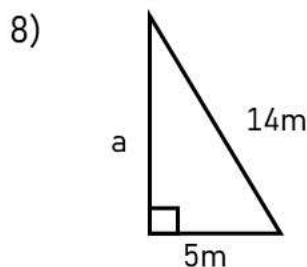
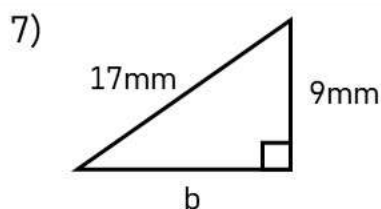
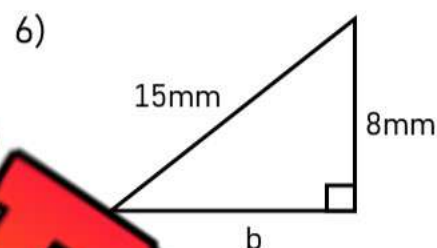
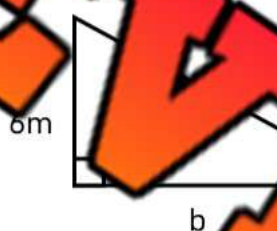
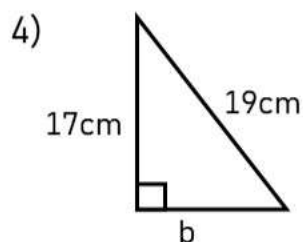
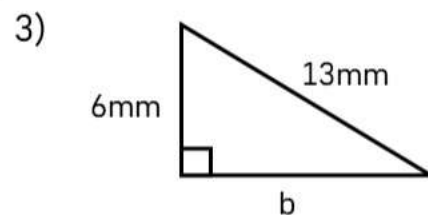
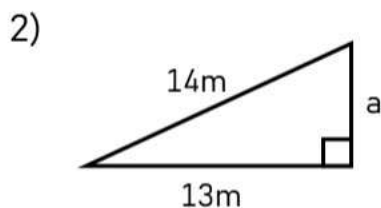
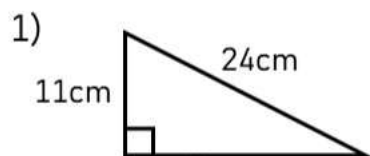
9)



Pythagorean Theorem – Missing Side

Instructions

Find the value of the missing side. Round the answer to the nearest tenth



Exit Cards

Cut Out

Cut out the exit cards below and have students complete them at the end of class

Name: _____

1) Find the value of the missing side.

a

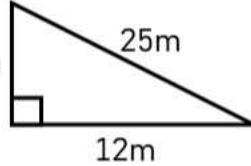


2) A rectangular park measures 45m by 60m. A diagonal path cuts across the park. Find the length of the path to the nearest tenth.

Name: _____

1) Find the value of the missing side.

a

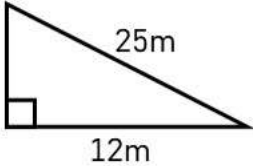


2) A rectangular park measures 45m by 60m. A diagonal path cuts across the park. Find the length of the path to the nearest tenth.

Name: _____

1) Find the value of the missing side.

a

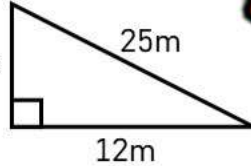


2) A rectangular park measures 45m by 60m. A diagonal path cuts across the park. Find the length of the path to the nearest tenth.

Name: _____

1) Find the value of the missing side.

a



2) A rectangular park measures 45m by 60m. A diagonal path cuts across the park. Find the length of the path to the nearest tenth.

Pythagorean Theorem – Word Problems

Instructions

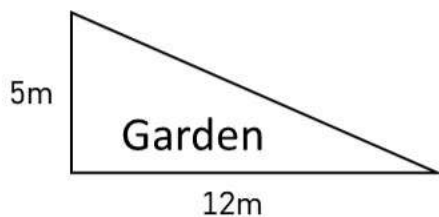
Answer the word problems below

- 1) Find the hypotenuse of a right triangle with a base of 10cm and a height of 6cm.

- 2) Lily walked 4 km south and 3 km east. Calculate how far Lily is away from her starting point.

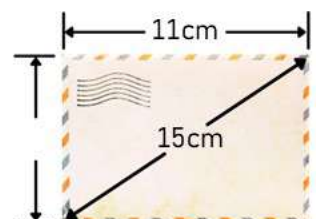


- 3) Julian built a triangular garden with the dimensions below. If he wanted to put a fence around his garden, how long would the fence need to be?

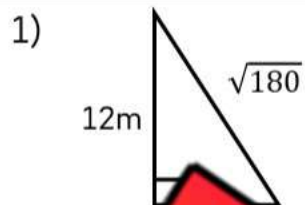


- 4) Ivy's house is a rectangular shape that is 15m wide by 9m long. What is the diagonal of her house (from corner to corner)?

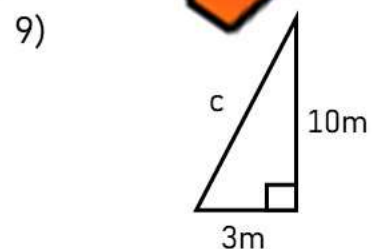
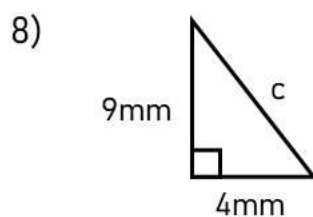
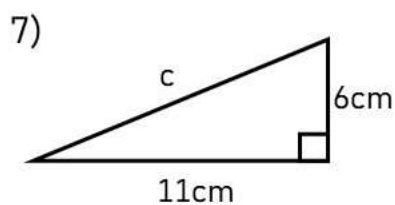
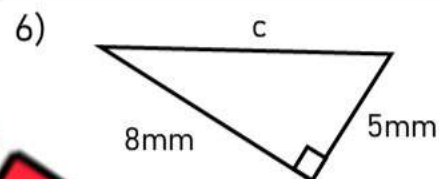
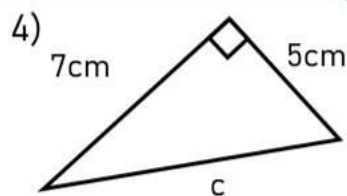
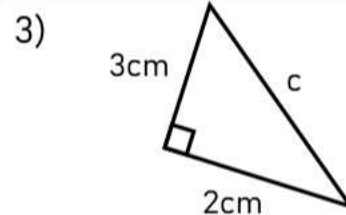
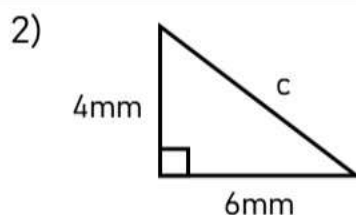
- 5) An envelope has the dimensions below. What is the height of the envelope?



Pythagorean Theorem – Missing Side

InstructionsFind the value of the missing side. Record your answer as a square root.

$$\begin{aligned}a^2 + b^2 &= c^2 \\12^2 + 12^2 &= c^2 \\144 + 144 &= c^2 \\288 &= c^2 \\\sqrt{288} &= \sqrt{c^2} \\c &= \sqrt{288}\end{aligned}$$

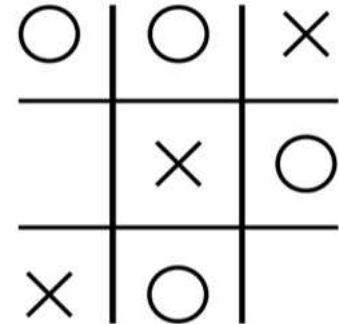


Math Tic-Tac-Toe: Pythagorean Challenge

Objective

What are we learning about?

Students will practice using the Pythagorean Theorem to find the missing side of right triangles in a fun, competitive game of tic-tac-toe. This activity will reinforce their problem-solving skills and teamwork.



Materials

What you will need for the activity.

- Whiteboard or paper
- Markers or pens to mark
- Pre-written Pythagorean Theorem problems for each cell of the tic-tac-toe grid)

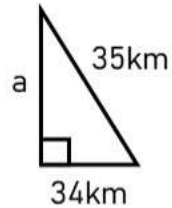
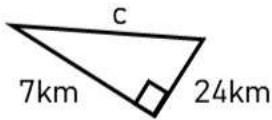
Instructions

How you will complete the activity

- 1) Preparation:** Hand out Tic-Tac-Toe worksheets to each pair of students. Each worksheet should have a large tic-tac-toe grid with a different Pythagorean Theorem problem in each cell. One side of the right triangle is missing in each problem.
- 2) Instructions:**
 - Students will play individually against each other, with one player being the "X" and the other "O."
 - The student playing "X" will go first. They will choose a cell, solve the Pythagorean Theorem problem in that cell, and check their answer with their partner. If the solution is correct, they place an X in that cell.
 - If the answer is incorrect, they do not place their mark, and it becomes the "O" player's turn. The "O" player will then choose a cell, solve the problem, and check their answer. If correct, they place an O in that cell.
 - The game continues with alternating turns.
- 3) Winning the Game:** The first player to get three marks in a row (horizontally, vertically, or diagonally) wins the game.
- 4) Discussion:** After the game, students should discuss with their partner the different strategies they used to solve the problems and any challenges they faced during the activity.

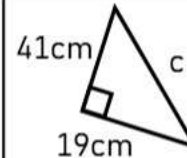
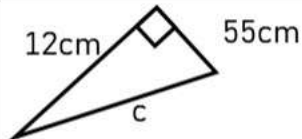
Tic-Tac-Toe

Use the following tic-tac-toe grids for the game.

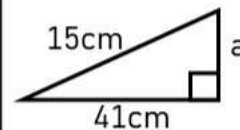


Sophia cycled 9km east and 12km south. Calculate her distance from the starting point.

The diagonal of a rectangular picture frame is 25 cm. One side measures 15 cm. Find the other side.



Noah's rectangular garden measures 30m by 40m. What is the length of the diagonal?

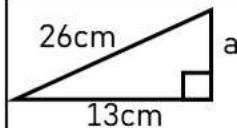


Rachel walked 12km south and 5km east. How far is she from her starting point?

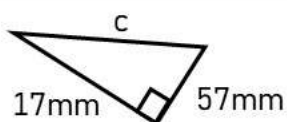
Isabella's rectangular garden measures 14m by 48m. What is the diagonal length?



Ethan walked 43km north and 24km west. Calculate how far he is from his starting point.



Harper's TV screen is 50 inches wide and 30 inches tall. Find the diagonal length.



Lily climbed 62m up a hill and moved 37m to the side. What is her diagonal distance?

Chloe's room is 66m wide and 71m tall. What is the diagonal length?

Tic-Tac-Toe

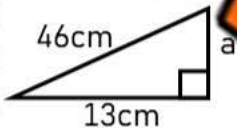
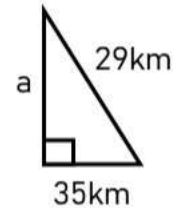
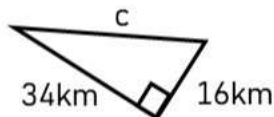
Use the following tic-tac-toe grids for the game.

Chris's living room measures 5 m by 12 m. Find the diagonal length.

Lisa climbs 3 m up a ladder and moves 4 m sideways on a scaffold. What is her diagonal distance from the ground?

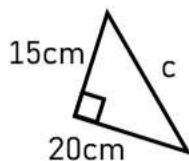
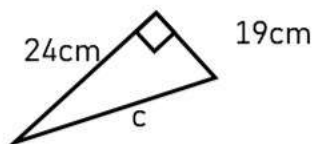
A triangle has legs of 5 cm and 12 cm. What is the hypotenuse?

A rectangular field is 12m wide and 35m long. What is the diagonal length?

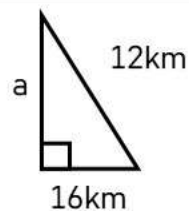


A triangle has legs of 60 cm and 80 cm. What is the length of the hypotenuse?

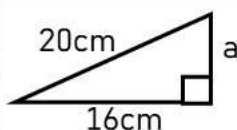
Ava jogged 7 km west and 24 km south. How far is she from her starting point?



Nathan walked 3km north and 4km east. Calculate the distance from his starting point.



Hannah hiked 15km east and 20 km south. How far is she from the starting point?



Mia flew her drone 8m upward and 15 m to the right. Calculate the diagonal distance.

Jamie's rectangular swimming pool measures 20m by 25m. Find the diagonal length.

Pythagorean Theorem – Word Problems

Instruction

Answer the word problems below

- 1) Robert has a 4m ladder that he is using to get as high as possible to hang his Christmas lights. He puts the ladder 2 metres away from the wall.

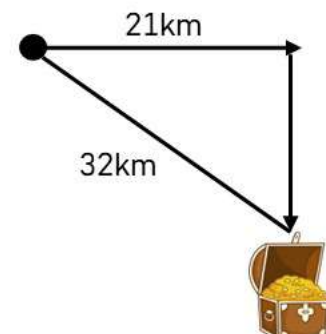
- a) Label the dimensions on the diagram
- b) How high is the top of the ladder off the ground?



- 2) Howard has a huge ladder to reach a very tall bookshelf. He needs to climb 9m to find the book he wants. How far away from the wall should he put the ladder to be at the height of the book he wants?



- 3) A pirate is on a treasure hunting mission. His GPS tells him he is 32km away from the treasure. He decides to travel 21km due east. The GPS now tells him that the treasure is due south from where his boat is. How far south does he need to travel to find the treasure?



Pythagorean Theorem – Word Problems

Instruction

Answer the questions below

1)

Jake's treehouse has a rope ladder that runs diagonally. It measures 26 meters long. The distance from the base of the tree to the bottom of the ladder on the ground is 10 meters. How far above the ground is the entrance to the treehouse?

2)

A rectangular playground has a diagonal length of 85 meters. If the width of the playground is 20 meters, how long is the length of the playground?

3)

A zip line is stretched between two trees with a horizontal distance of 12 meters between them. The zip line is anchored at a height of 3 meters on one tree and at a height of 8 meters on the other tree. How far apart horizontally are the trees in meters?

4)

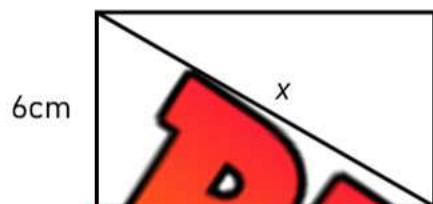
A tightrope walker is practicing on a rope that measures 25 meters long. The rope is tied between two poles that are 24 meters apart horizontally. If the tightrope walker walks down the rope, how many metres down is it from start to finish?

Pythagorean Theorem – Missing Side

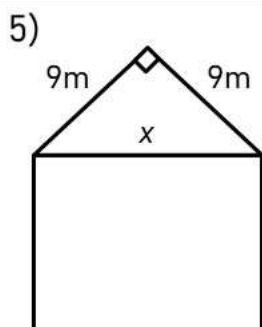
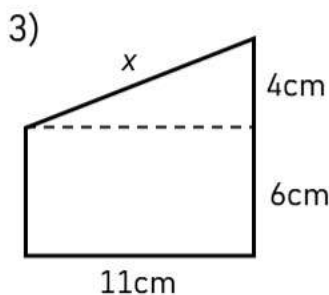
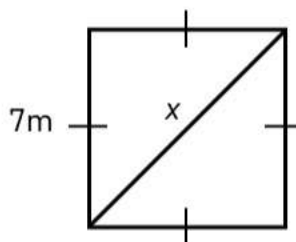
InstructionFind the value of x .

Round the answer to the nearest tenth or leave as a square root

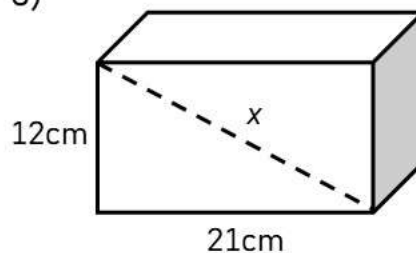
1) 11cm



2)



6)



Pythagorean Theorem – Word Problems

Instruction

Answer the word problems below

- 1) TVs are measured diagonally from corner to corner. Jeffrey wants a 150cm TV. He likes the look of one that has a base of 140cm and a height of 54cm. Is the TV 150cm diagonally?



- 2) To get from point A to point B, you need to walk around the pond. To avoid the pond, you walk 50m and 40m. To the nearest metre, how many metres would you have saved if you could walk through the pond?



- 3) A baseball diamond is a square with sides of 30m. What is the distance between first base and third base?

- 4) The local fire department has been called to a burning building. They need their ladder to reach the 4th floor, which is 22m high. They know that the ladder will need to be at least 12m away from the building. If they brought a 25m ladder, will they reach the fourth floor?

Pythagorean Theorem – Word Problems

Instruction

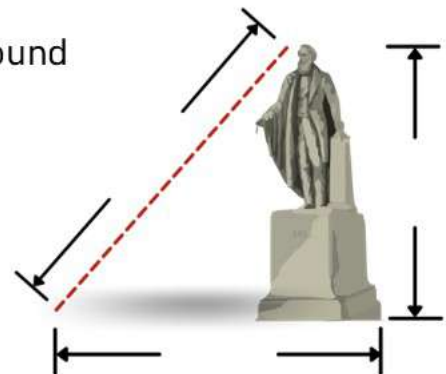
Answer the word problems below

- 1) Steven brings his hang glider 30m to the top of a mountain. He travels southeast 60m before landing on the ground. How far does he need to walk back to the base of the mountain?

- 2) A flagpole on a hill casts a shadow of 6m on the ground away from the base of the hill. What is the distance from the top of the flagpole to the end of the shadow?

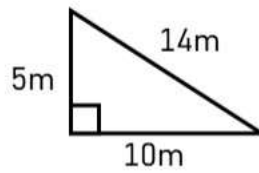
- 3) A building casts a shadow on the ground 12m away from the building. The length from the top of the building to the end of the shadow is 13m. How tall is the building?

- 4) A statue is 8m tall and it casts a shadow on the ground that is 6m long. What is the length from the top of the statue to the end of the shadow?



Identify Right Triangles – Pythagorean Theorem

We can use the Pythagorean Theorem to find out if a triangle is a right triangle or not. If we have all the measurements of the triangle, we can plug them into the equation. If the equation is true, the triangle is a right triangle and if it is false, it is not.

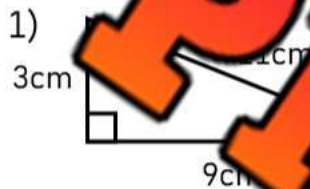


Solution

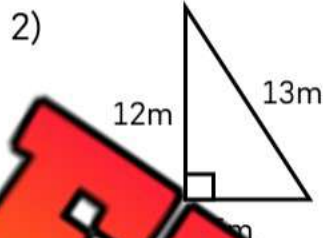
$$\begin{aligned} a^2 + b^2 &= c^2 \\ 5^2 + 10^2 &= 14^2 \\ 25 + 100 &= 196 \\ 125 &\neq 196 \end{aligned}$$

This equation is false, therefore this is not a right triangle

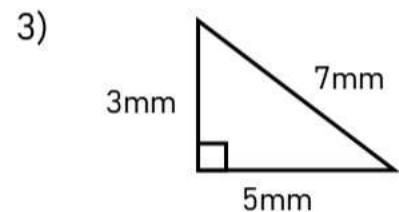
Questions Is the triangle a right triangle?



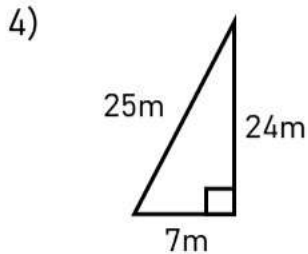
Yes No



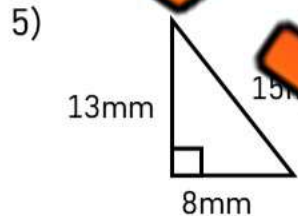
No



Yes No



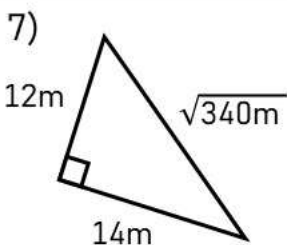
Yes No



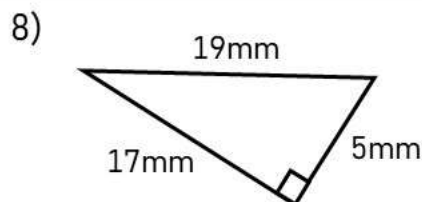
Yes No



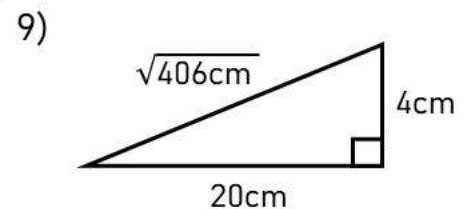
Yes No



Yes No



Yes No



Yes No

First Peoples Constellations: Are These Right Triangles?**Instructions** Determine whether star paths in First Peoples constellations form right triangles.

1)

In a constellation called Draco Minor, the distance between Star X and Star Y is 30 light-years. The distance between Star Y and Star Z is 40 light-years. The distance between Star X and Star Z is 50 light-years. Determine whether this triangle is a right triangle.



2)

Astronomers are studying stars in the constellation Lyra. Star M is 9 light-years from Star P. Star N is 12 light-years from Star P. Star M is 14 light-years from Star N. Use the Pythagorean theorem to decide if the stars form a right triangle.



3)

In the constellation Aquila, Star A and Star B are 15 light-years apart. Star B and Star C are 21 light-years apart. Star A and Star C are 20 light-years apart. Are these distances consistent with a right triangle?



4)

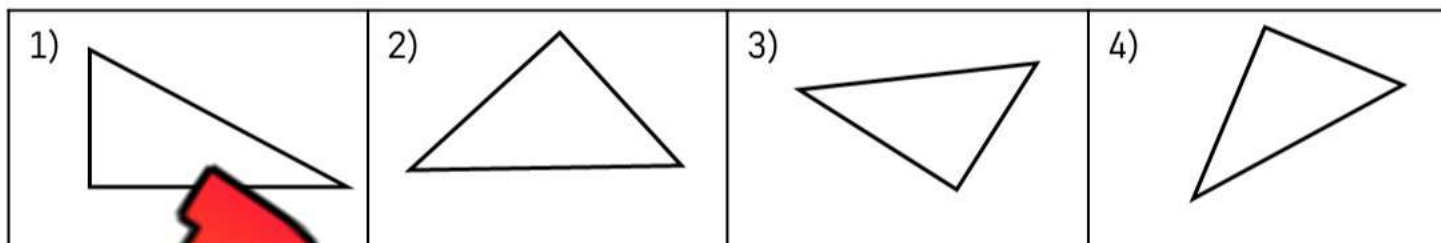
Three stars in the constellation Cygnus form a triangle. The distances between the stars are 10 light-years, 10 light-years, and 14 light-years. Do these stars form a right triangle? Explain how you know.



Pythagorean Theorem – Quiz

Part 1

Label the sides of the right triangles: a, b, and c



Part 2

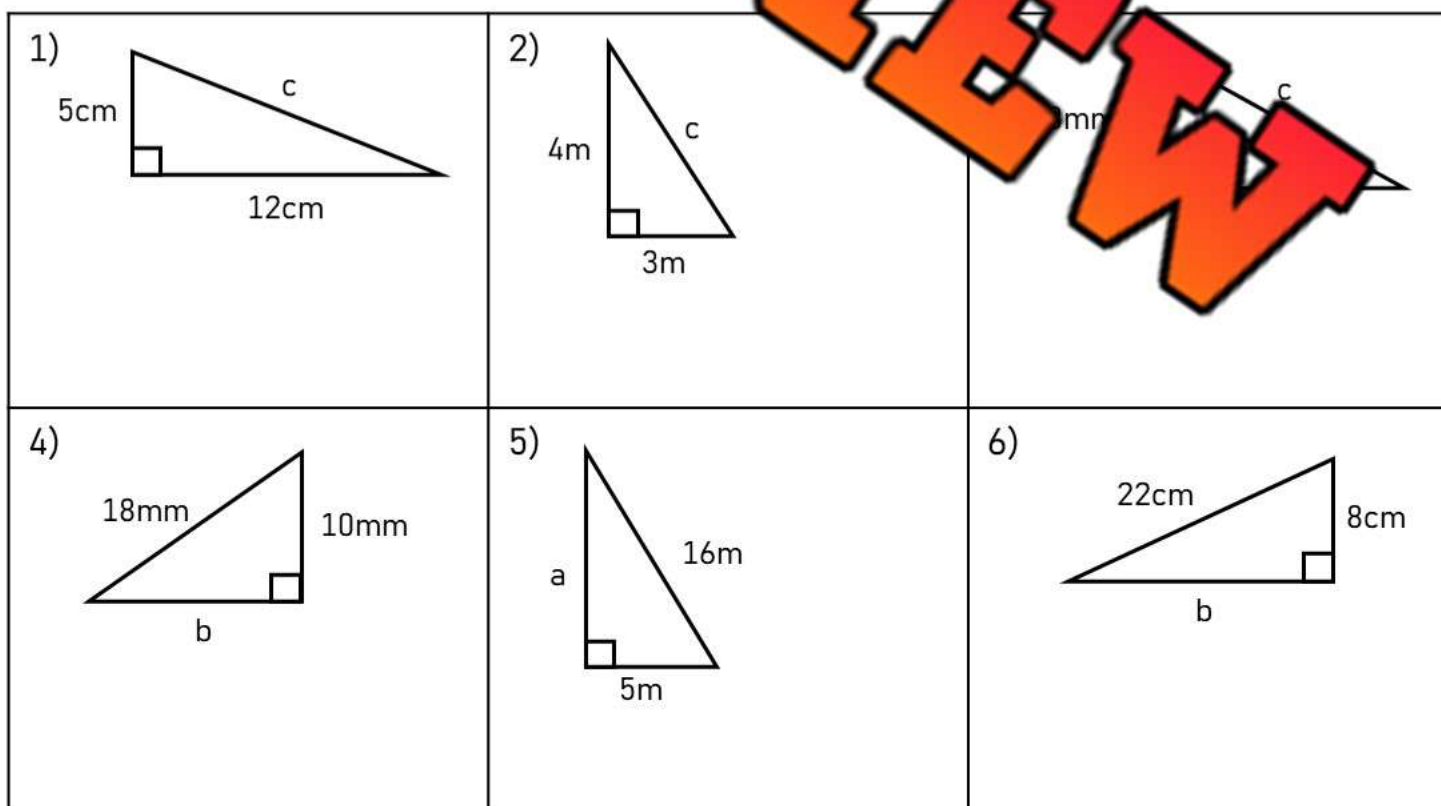
Find the value of the missing side

	Question	Answer
1)	7^2	
2)	9^2	
3)	$\sqrt{16}$	

	Question	Answer
4)	$\sqrt{121}$	
5)	$\sqrt{64}$	
	6^2	

Part 3

Find the value of the missing side

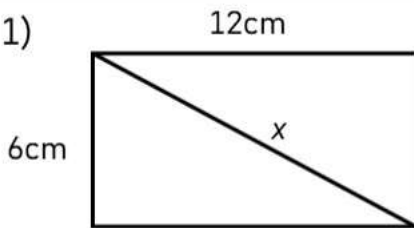


Part 4

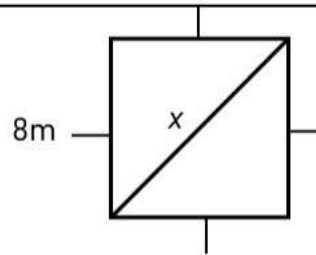
Find the value of x .

Round the answer to the nearest tenth or leave as a square root

1)



2)



Part 5

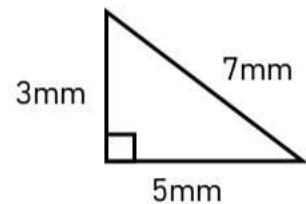
Is the triangle a right triangle?

1)



Yes No

3)



Yes No

Part 6

Is the triangle a right triangle?

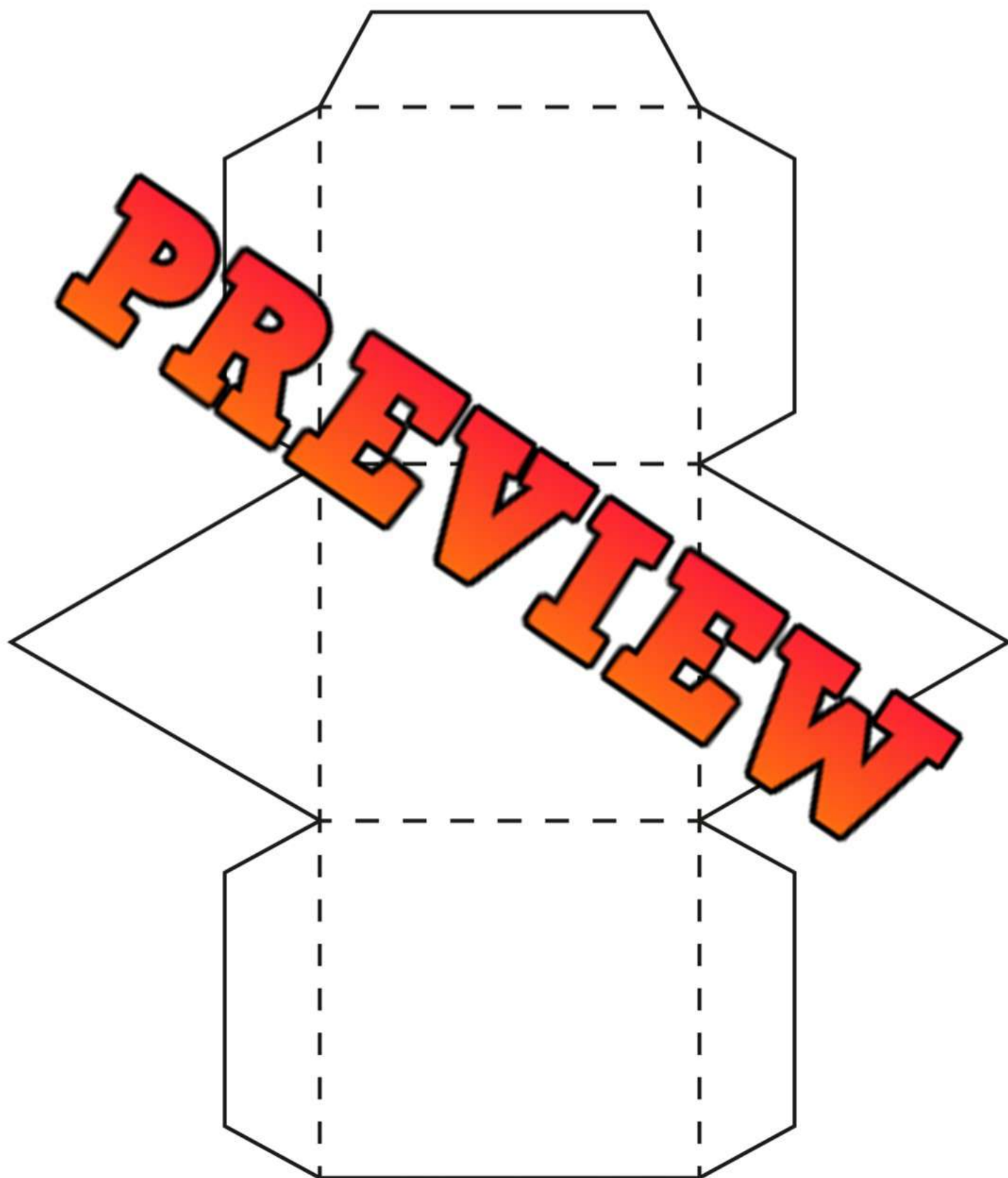
- 1) A 14m ladder is leaning against a house. The bottom of the ladder is 10m from the house. How high does the ladder reach to the nearest tenth?
- 2) A building casts a shadow of 10m on the ground. The length from the top of the building to the end of the shadow is 26m. How tall is the building?

Name: _____

95

Curriculum Connection
MG.3

3D Model – Triangle Based Prism Net

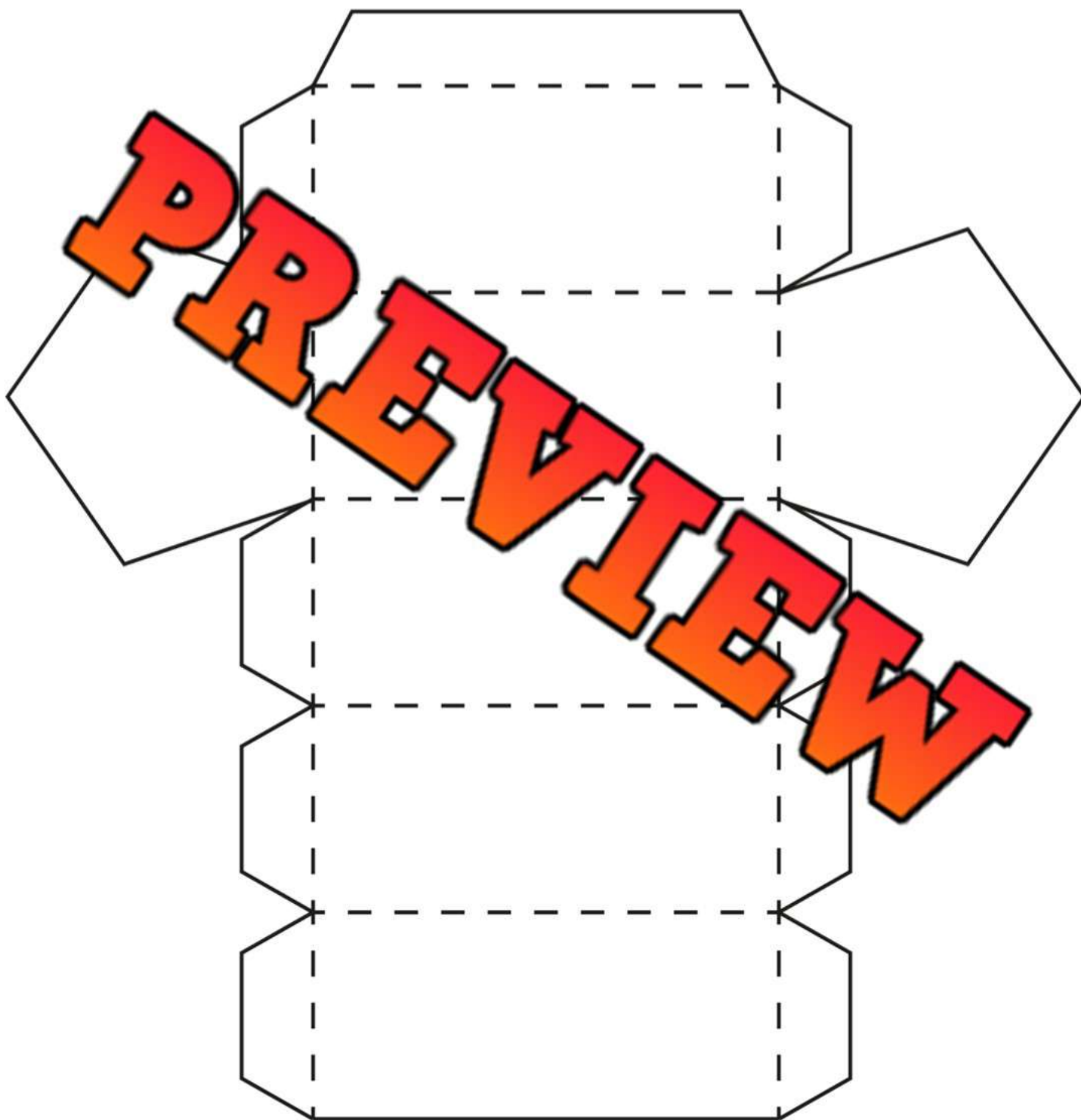


Name: _____

98

Curriculum Connection
MG.3

3D Model – Pentagon Based Prism Net



Name: _____

100

Curriculum Connection
MG.3

3D Model – Cone Net

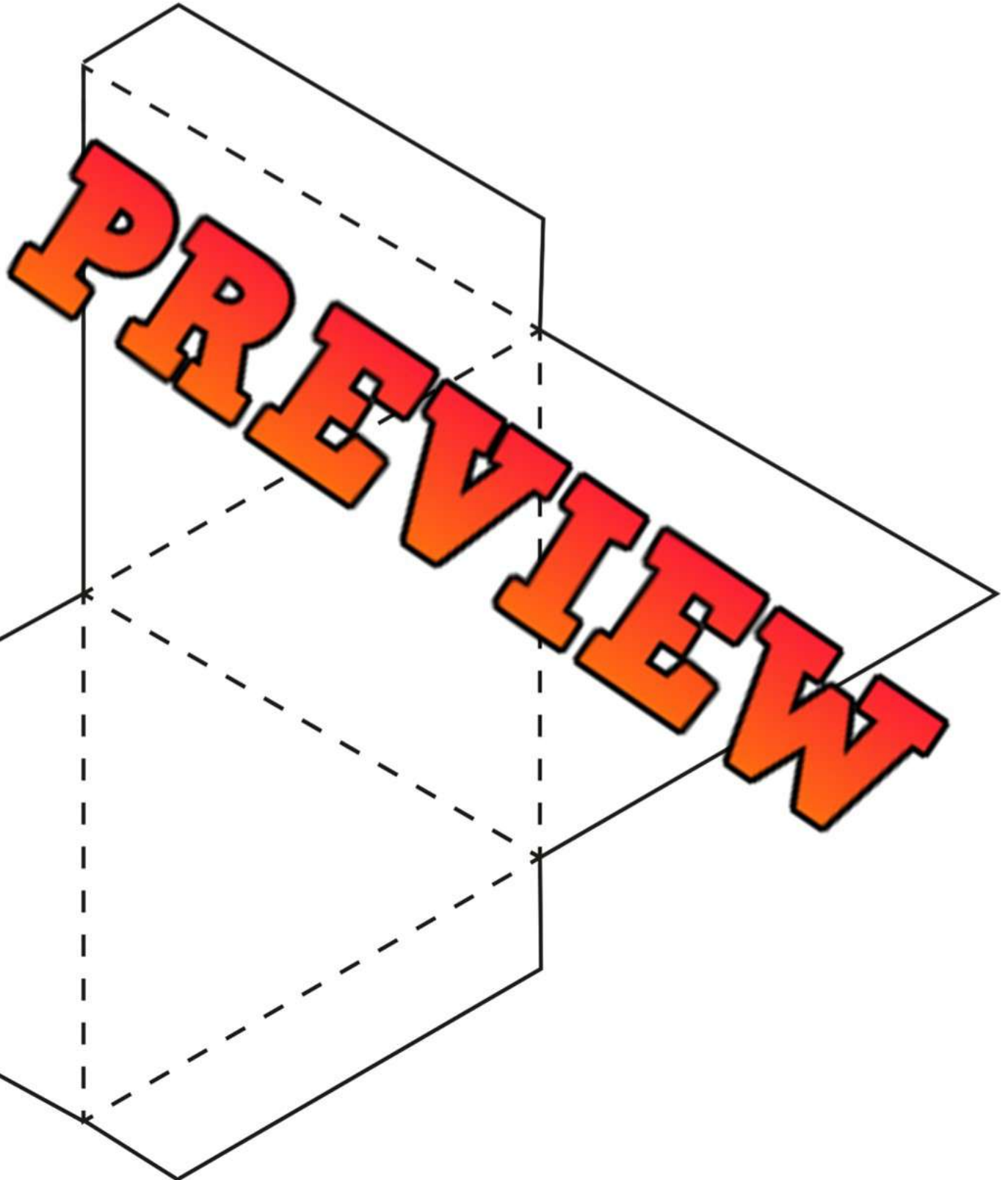


Name: _____

102

Curriculum Connection
MG.3

3D Model – Triangle Based Pyramid Net



Name: _____

104

Curriculum Connection
MG.3

3D Model – Pentagon Based Pyramid Net

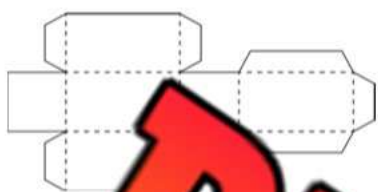


Nets Representing 3D Objects

Instruction

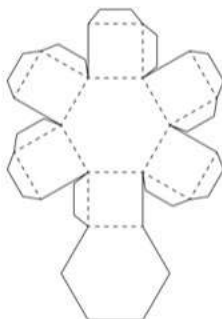
Identify and circle the 3D object formed by each net

1)



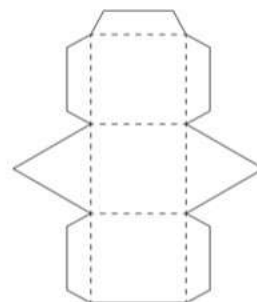
- Rectangular Prism
- Cylinder
- Cube

2)



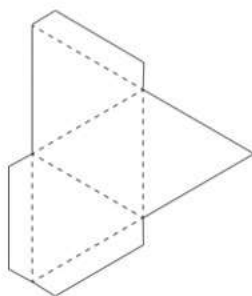
- Rectangular Prism
- Hexagonal Prism
- Triangular Prism

3)



- Rectangular Prism
- Pentagonal Prism
- Triangular Prism

4)



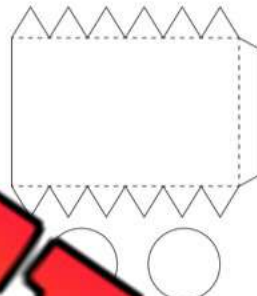
- Rectangular Pyramid
- Pentagonal Pyramid
- Triangular Pyramid

5)



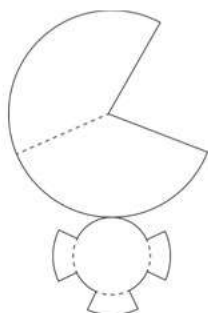
- Rectangular Pyramid
- Square Pyramid
- Triangular Pyramid

6)



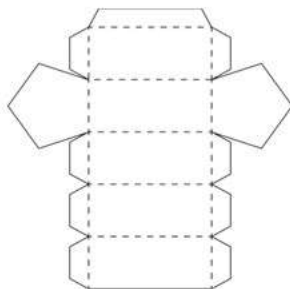
- Rectangular Prism
- Cone
- Cylinder

7)



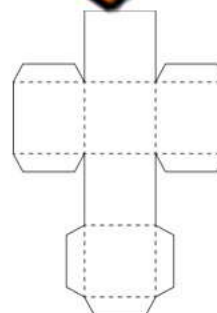
- Rectangular Prism
- Cylinder
- Cone

8)



- Rectangular Prism
- Pentagonal Prism
- Cube

9)



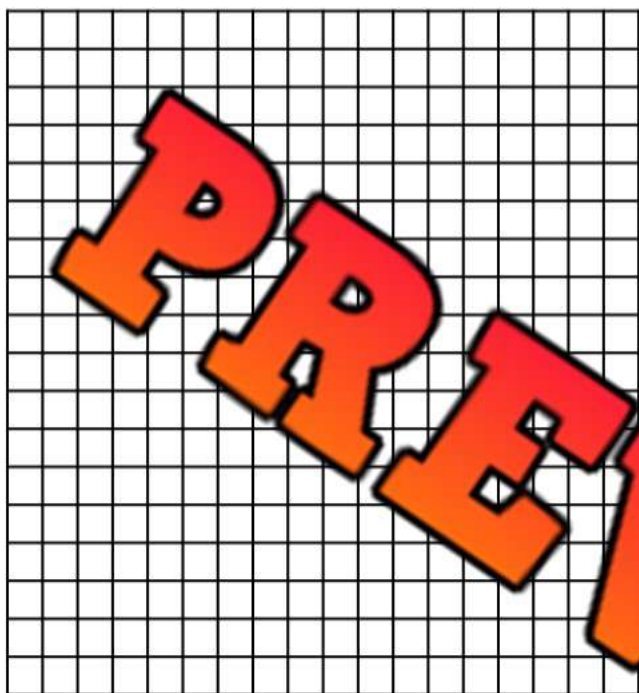
- Rectangular Prism
- Pentagonal Prism
- Cube

Drawing Nets – 3D Objects

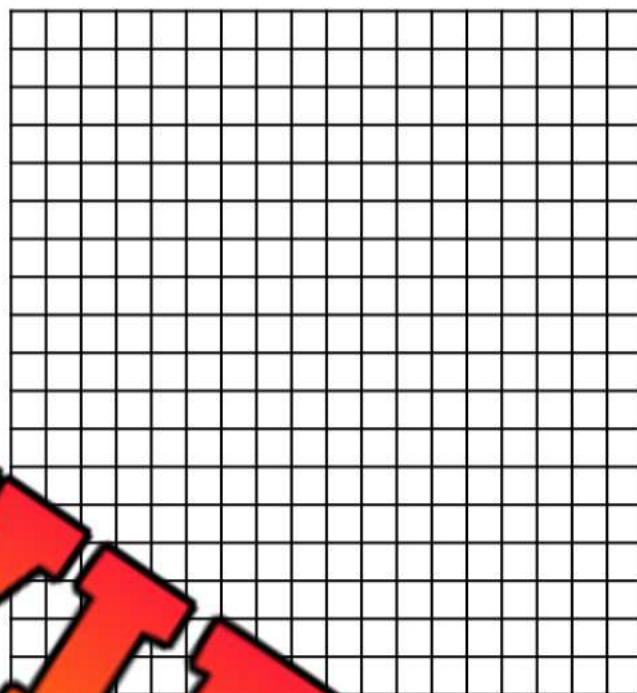
Instructions

Draw the 3D objects using the grids below

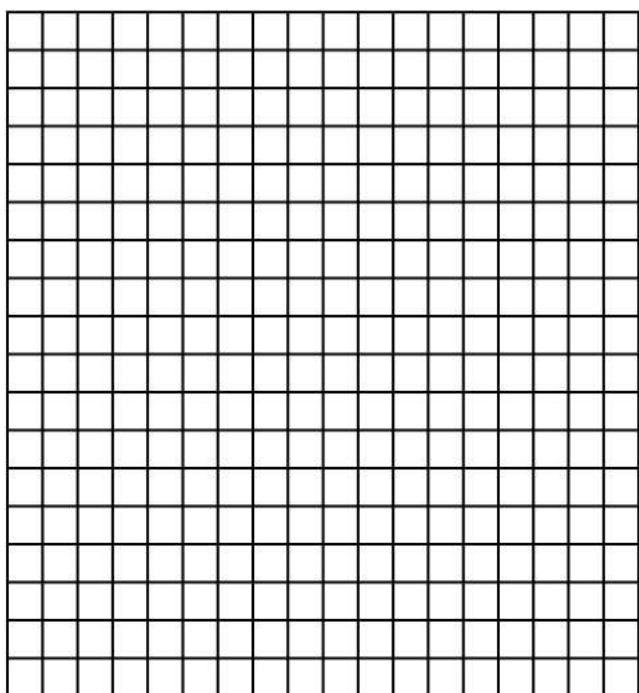
1) Rectangular Prism



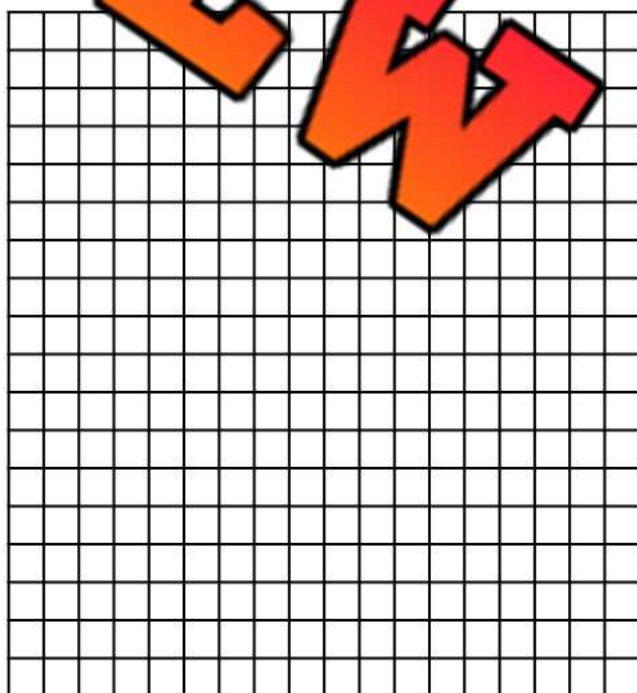
2) Rectangular Prism



3) Triangular Prism



4) Triangular Prism



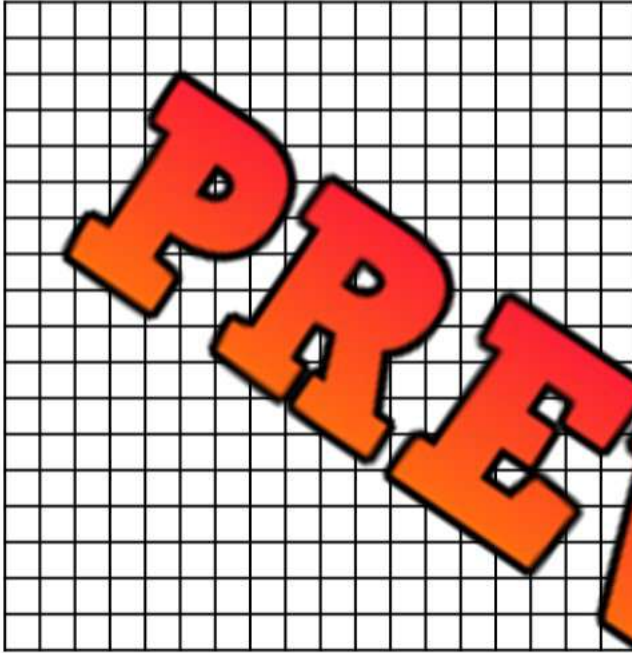
Exit Cards

Cut Out

Cut out the exit cards below and have students complete them at the end of class

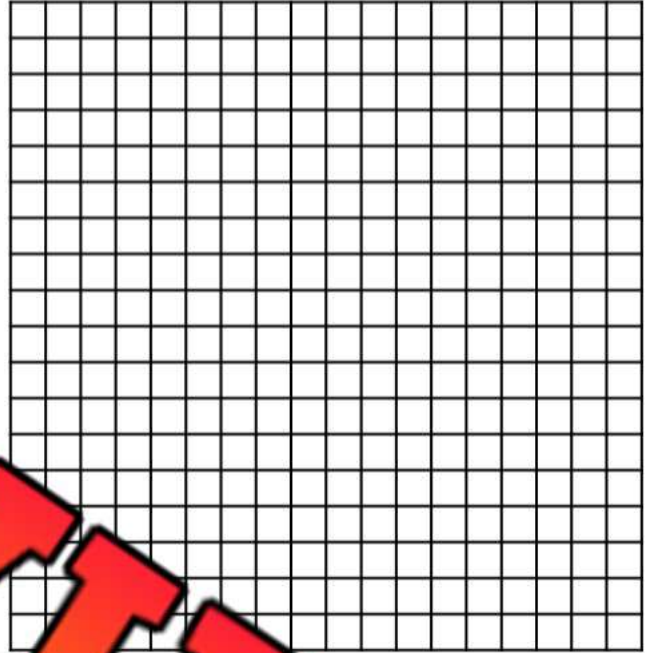
Name: _____

Draw the **Octagonal Prism** using the grid.



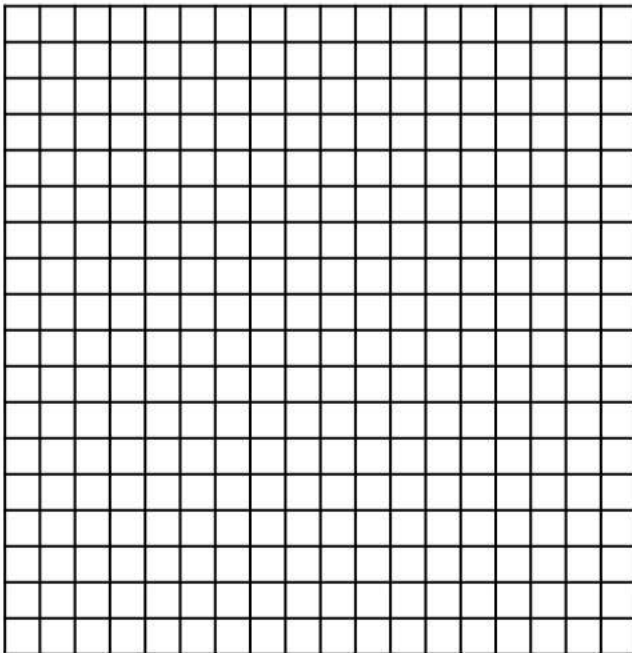
Name: _____

Draw the **Octagonal Prism** using the grid.



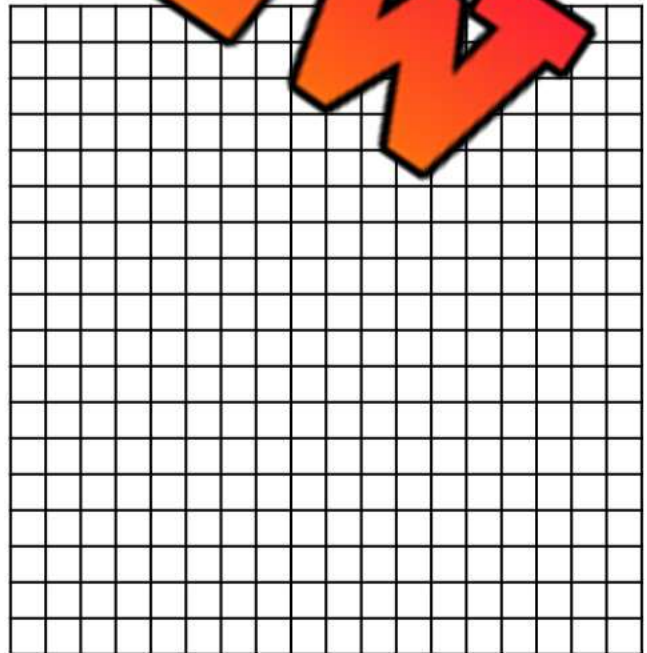
Name: _____

Draw the **Octagonal Prism** using the grid.



Name: _____

Draw the **Octagonal Prism** using the grid.

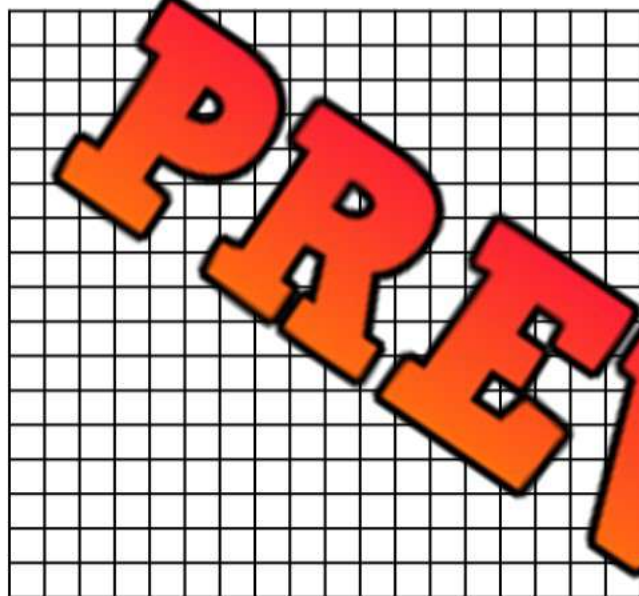
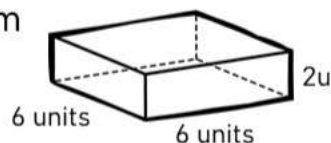


Drawing Nets – 3D Objects

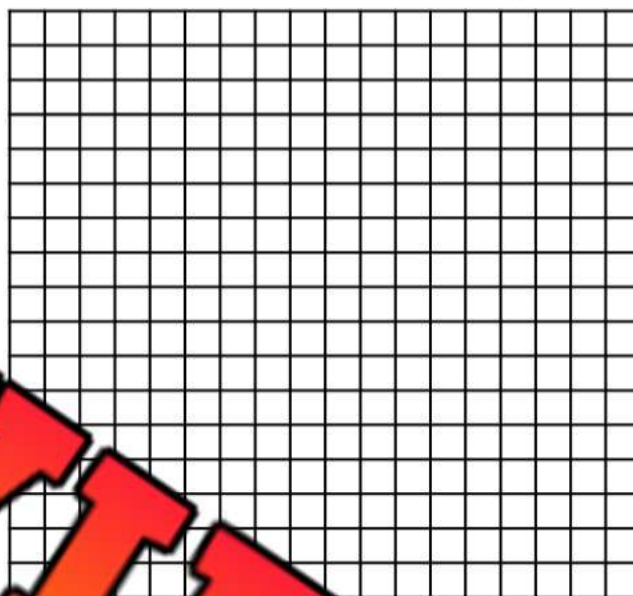
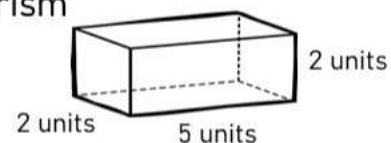
Instructions

Draw the nets based on the dimensions provided

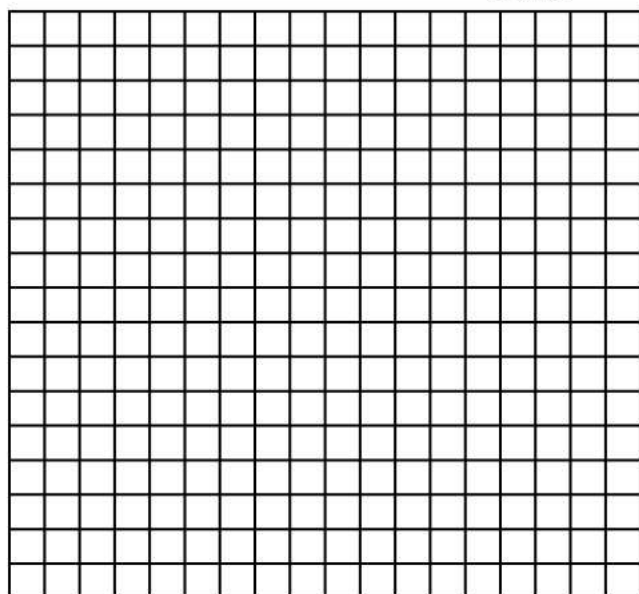
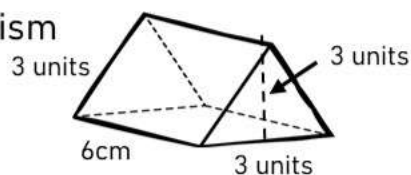
1) Rectangular Prism



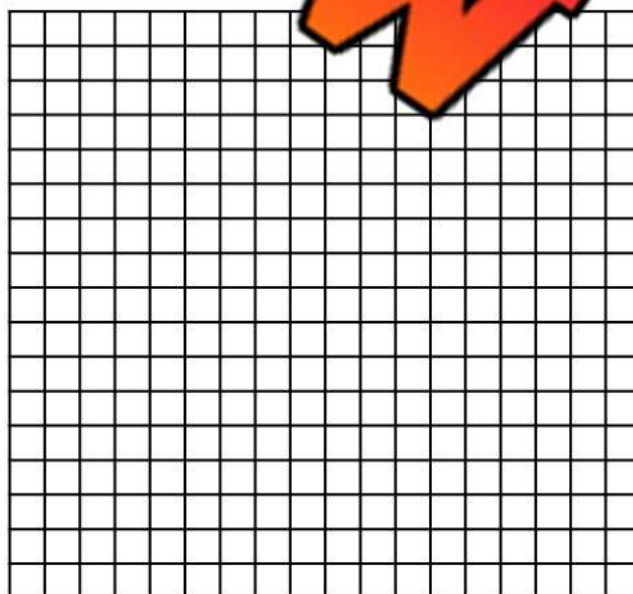
2) Rectangular Prism



3) Triangular Prism



4) Rectangular Prism

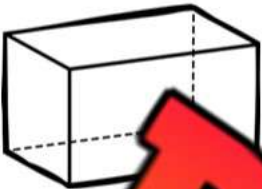


Drawing Nets – 3D Objects

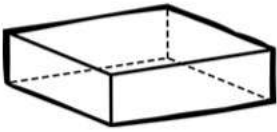
Instructions

Draw two different nets of the 3D objects

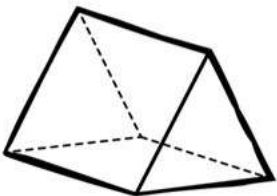
1)



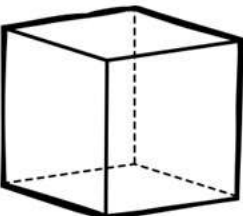
2)



3)



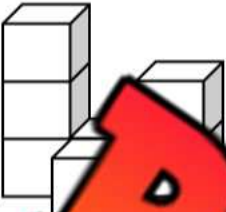
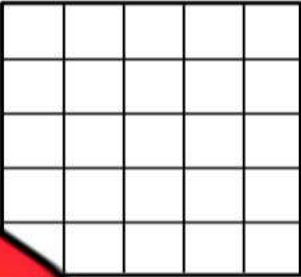
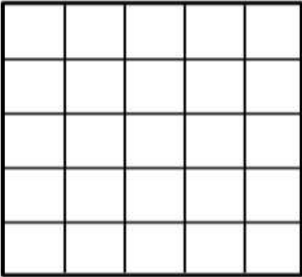
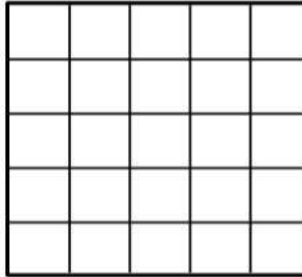
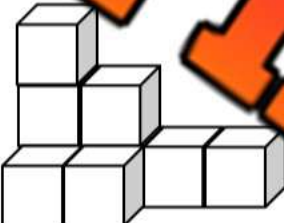
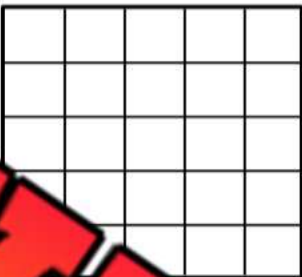
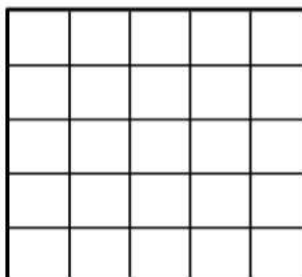
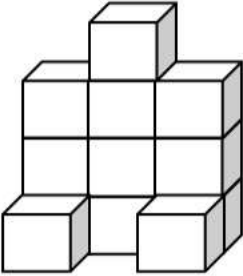
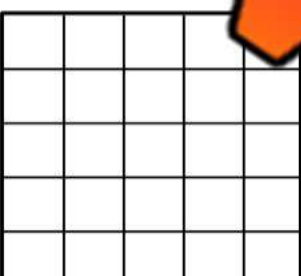
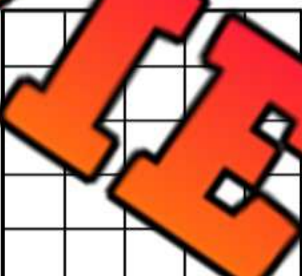
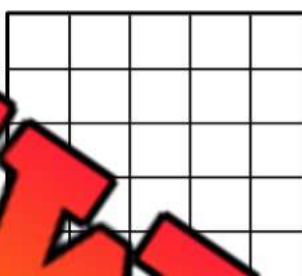
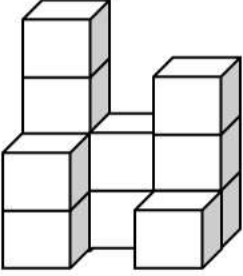
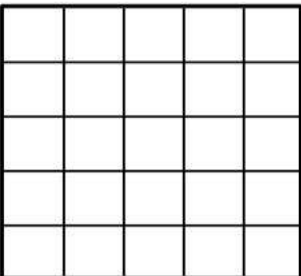
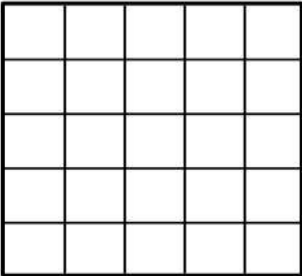
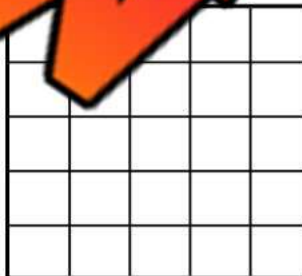
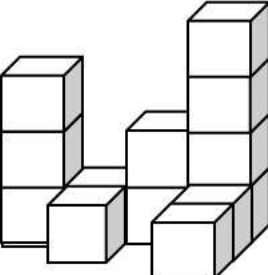
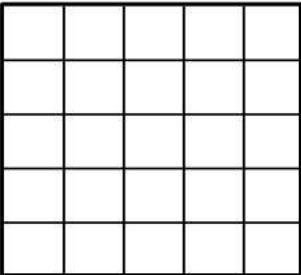
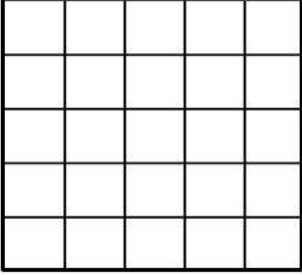
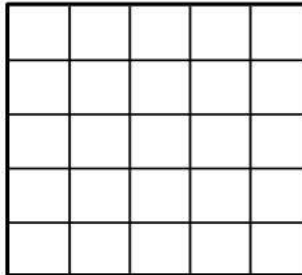
4)

**PREVIEW**

Drawing Top, Front, and Side Views of Objects

Instructions

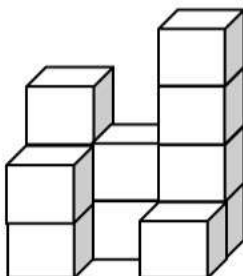
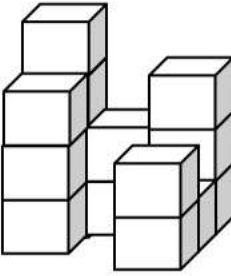
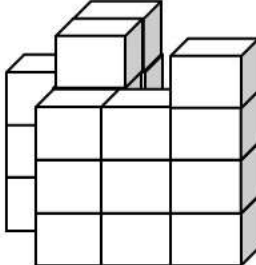
Draw the top, front, and side view of the objects below

Original Shape	Top View	Front View	Side View
1) 			
2) 			
3) 			
4) 			
5) 			

Drawing Top, Front, and Side Views of Objects

Instructions

Draw the top, front, and side view of the objects below

Original Shape	Top View	Front View	Side View
1) 			
2) 			
3) 			
4) 			
5) 			

Exit Cards

Cut Out

Cut out the exit cards below and have students complete them at the end of class

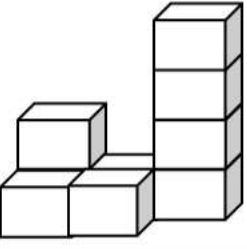
Name: _____

Instructions: Draw the top, front, and side view of the objects below

Original Shape	Top View	Front View	Side View
			

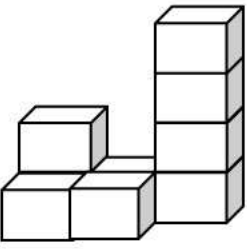
Name: _____

Instructions: Draw the top, front, and side view of the objects below

Original Shape	Top View	Front View	Side View
			

Name: _____

Instructions: Draw the top, front, and side view of the objects below

Original Shape	Top View	Front View	Side View
			

Drawing Top, Front, and Side Views of Objects

Instruction Look at the front, top, and side views and circle the matching 3D object

1) Top View	Front View	Side View

2) Top View	Front View	Side View

3) Top View	Front View	Side View

4) Top View	Front View	Side View

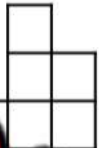
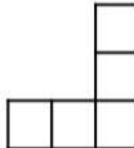
5) Top View	Front View	Side View

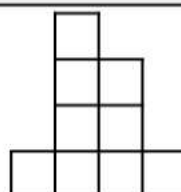
6) Top View	Front View	Side View

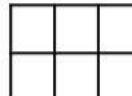
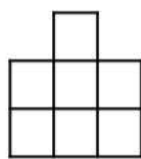
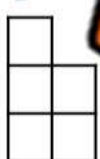
Drawing Top, Front, and Side Views of Objects

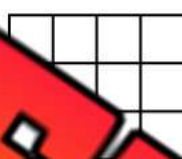
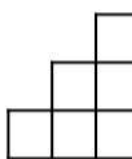
Instruction

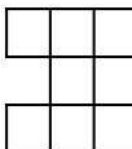
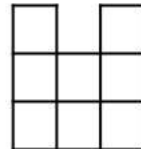
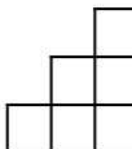
Draw the 3D objects by using the top, front, and side views

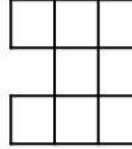
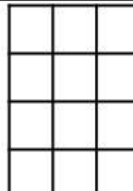
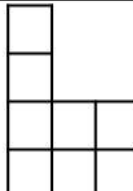
Top View	Front View	Side View
		
1)		

Top View	Front View	Side View
		
2)		

Top View	Front View	Side View
		
3)		

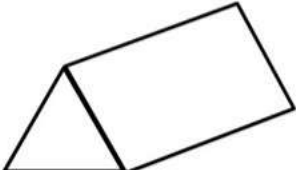
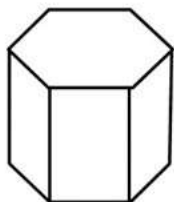
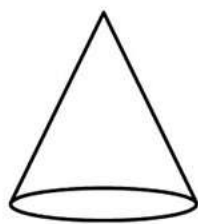
Top View	Front View	Side View
		
4)		

Top View	Front View	Side View
		
5)		

Top View	Front View	Side View
		
6)		

Drawing Top, Front, and Side Views – 3D Shapes**Instruction**

Draw the top, front, and side views of the 3D shapes

3D Shape	Top View	Front View	Side View
			
			
			
			
			
			

Drawing Top, Front, and Side – Bentwood Boxes**Instruction**

Draw the top, front, and side views of the Bentwood Boxes

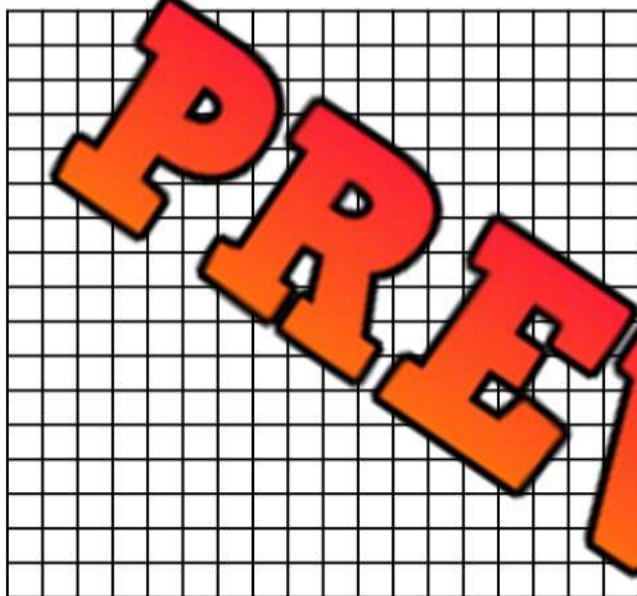
3D Shape	Top View	Front View	Side View
			
			
			
			
			

Drawing Nets – 3D Objects

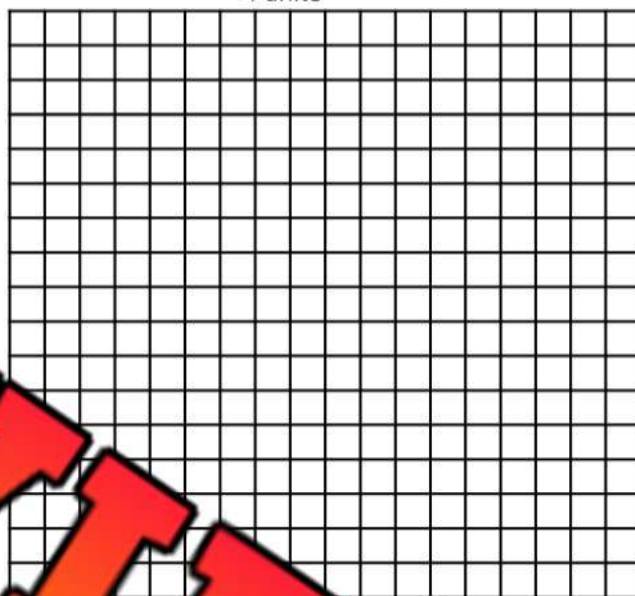
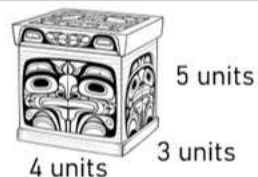
Instructions

Draw the nets of the Bentwood Boxes below

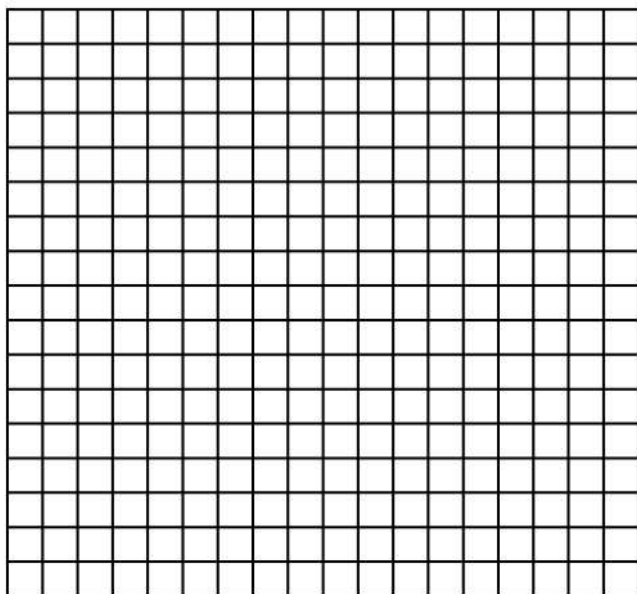
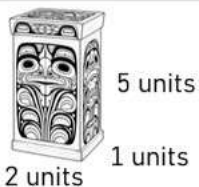
1)



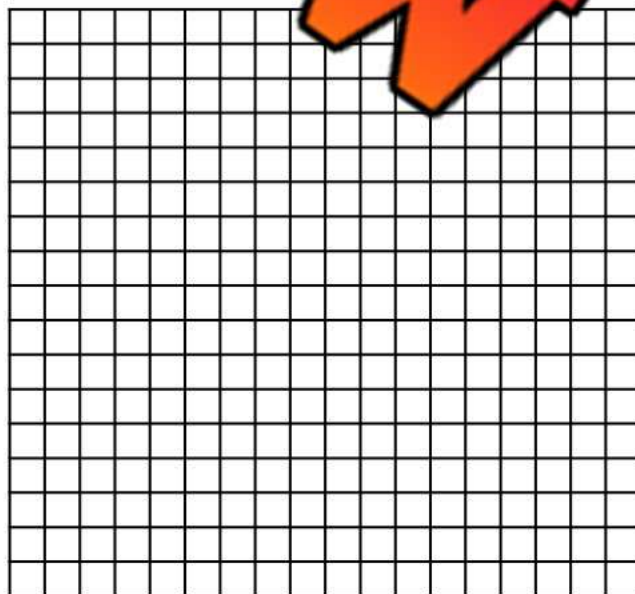
2)



3)



4)



Name: _____

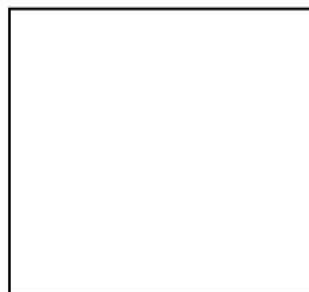
134

Curriculum Connection
MG.3

Drawing Perspective Views - Boxes

Questions

- 1) Connect the corners of the boxes to the vanishing point
- 2) Draw the sides of the boxes with horizontal lines and vertical lines



Name: _____

137

Curriculum Connection
MG.3

Perspective Drawings – Stars

Questions

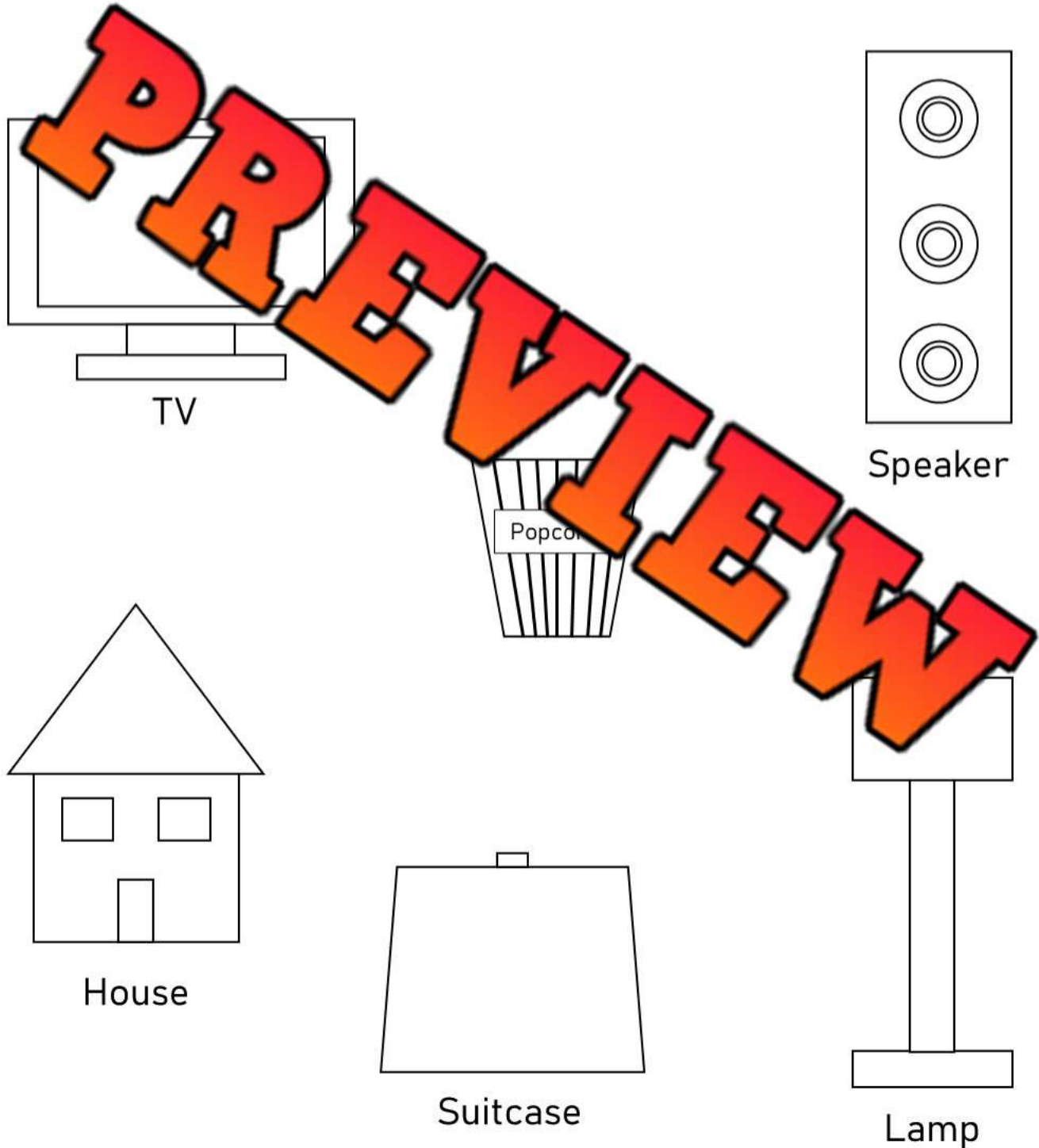
- 1) Connect the corners of the stars to the vanishing point
- 2) Draw the sides of the stars parallel to the shape of the star



Perspective Drawings – Real-Life Objects

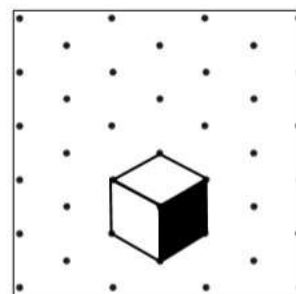
Questions

- 1) Connect the corners of the objects to the vanishing point
- 2) Draw the sides of the objects with parallel lines

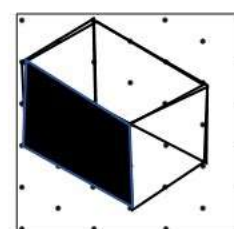
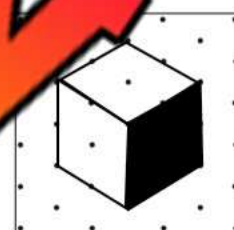
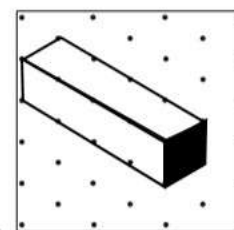
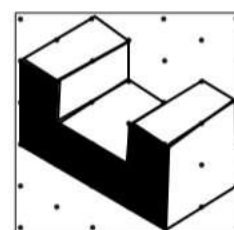
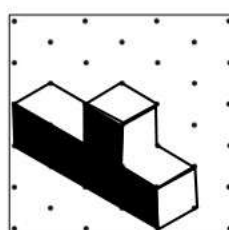
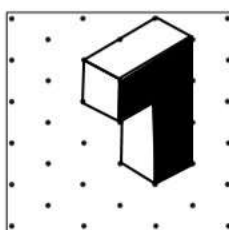
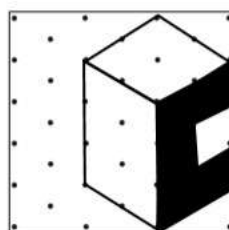
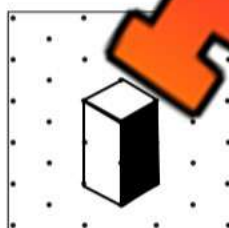


Isometric Projections

Isometric projections are drawn on a triangular grid. They are used to represent 3D objects in a 2D drawing. The projections show all lengths in the same scale, including the lines that show depth. However, angles are distorted to create the appearance of perspective. Therefore, a 90° angle in real life appears as 60° in an isometric projection.



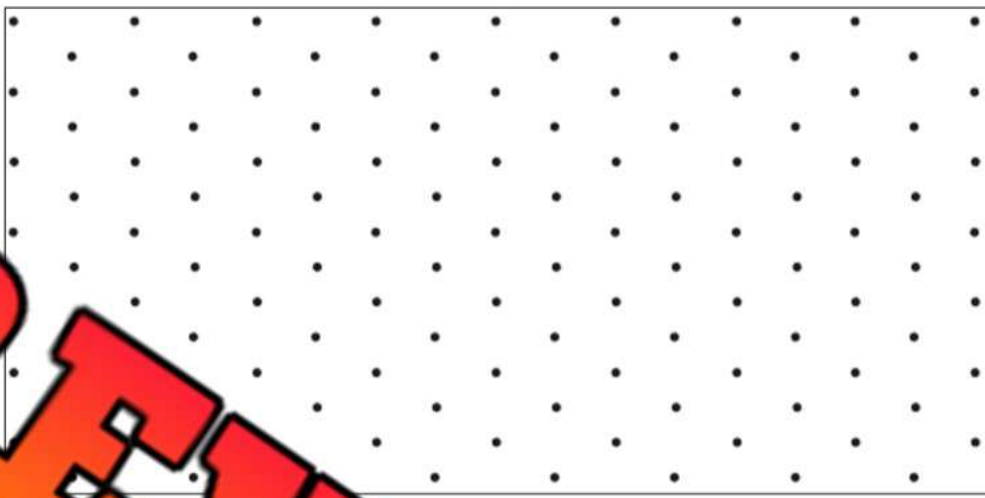
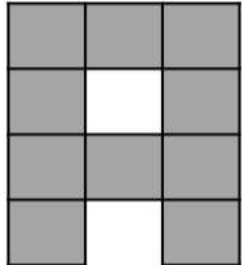
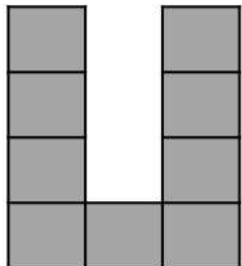
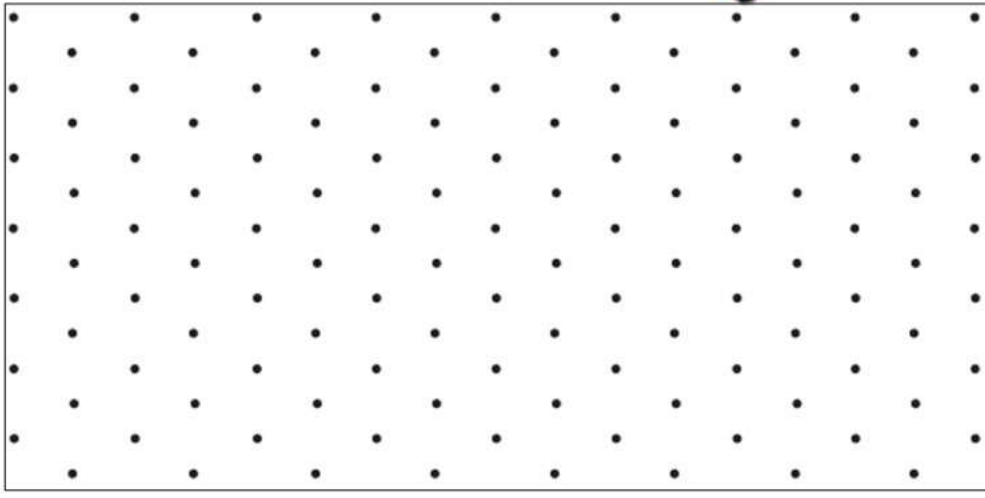
Questions Copy the 8 three-dimensional drawings using the isometric dot paper



Isometric Projections

Questions

Draw the isometric view of each letter. Use a scale of 1:1.

Letter	Front View	Isometric View
T		
A		
U		

Name: _____

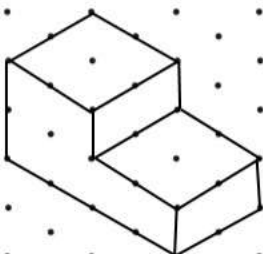
142

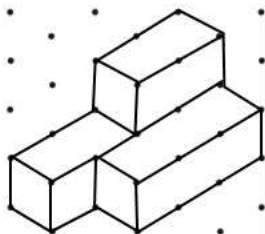
Isometric Projections

Questions

Draw the top, front, and side views of the isometric drawing

Isometric View	Top View	Front View	Side View
			

Isometric View	Top View	Front View	Side View
			

Isometric View	Top View	Front View	Side View
			

Cavalier vs Cabinet Drawings

Cavalier Drawings – Full size – All 3 Dimensions

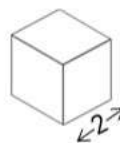
- 1) Draw the front view first
- 2) Use the same depth as the isometric view

Cabinet Drawings – Depth is projected in half

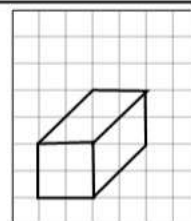
- 1) Draw the front view first
- 2) Use half of the depth as the isometric view

Isometric View

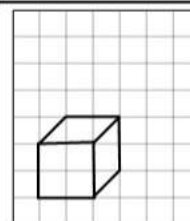
Cube



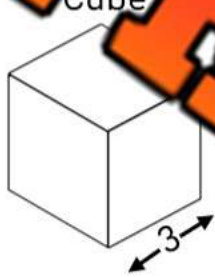
Cavalier

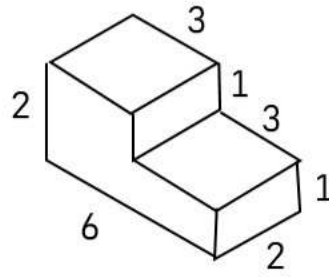


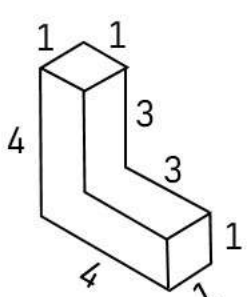
Cabinet



Questions Draw the top, front, and side views of the isometric drawing

	Cavalier	Cabinet
1) 		

Isometric View	Cavalier	Cabinet
2) 		

Isometric View	Cavalier	Cabinet
3) 		

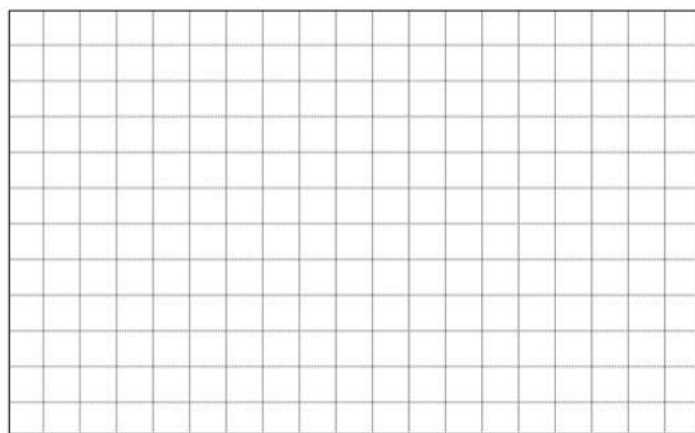
Cabinet Projections

Questions

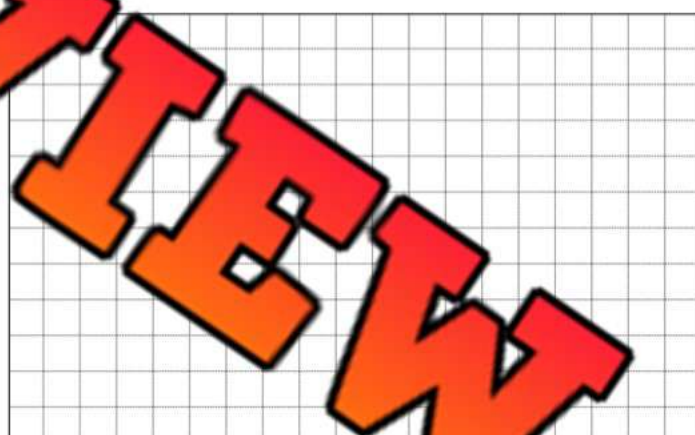
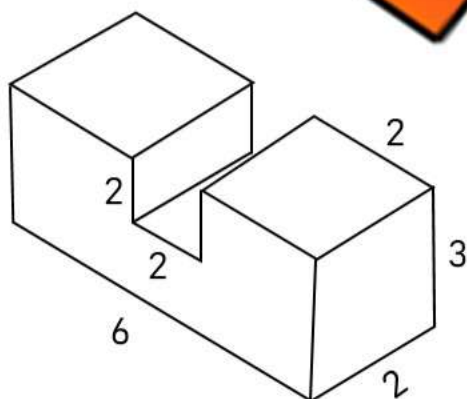
Draw the top, front, and side views of the isometric drawing

Isometric Drawing**Cabinet Drawing**

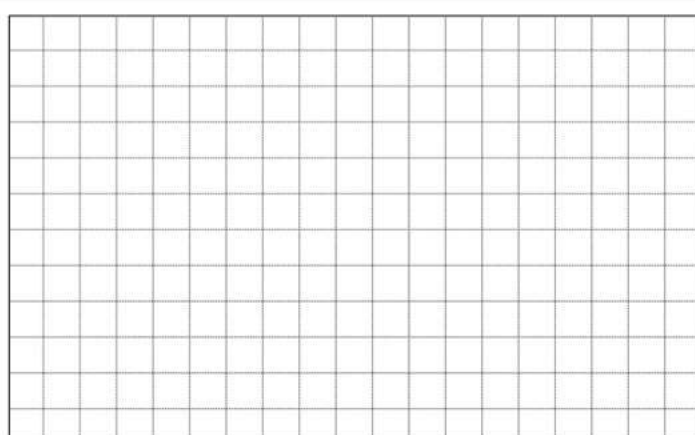
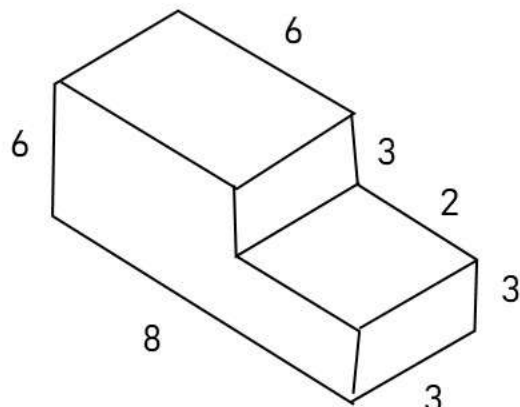
1)

**Isometric Drawing****Cabinet Drawing**

2)

**Isometric Drawing****Cabinet Drawing**

3)

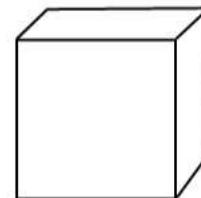
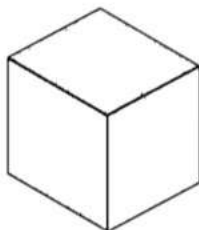
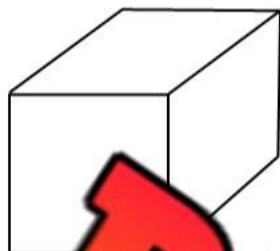


Different Drawing Types

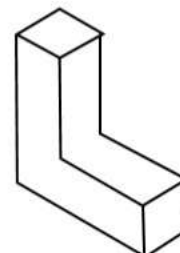
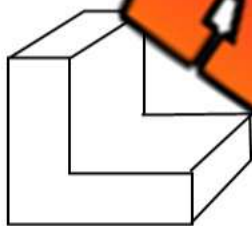
Part 1

Label the drawings – isometric, cavalier, or cabinet

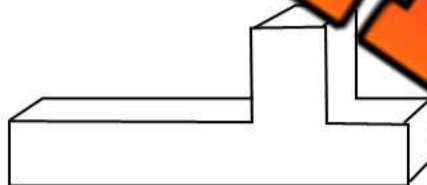
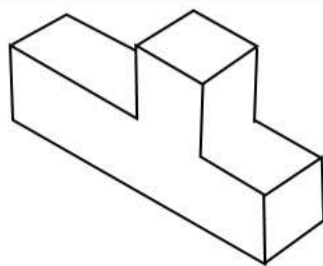
1)



2)



3)

**Part 2**

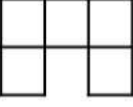
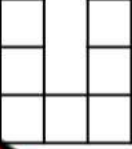
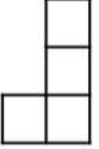
Answer the questions below

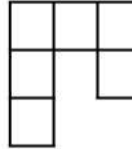
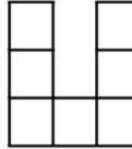
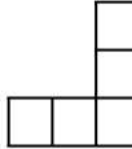
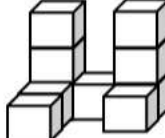
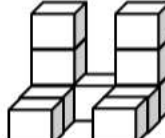
- 1) Which type of drawing uses the exact measurements – side lengths and angles?
- 2) Which type of drawing gives the most realistic representation? Explain.

Unit Test – Construction Views and Nets

Part 1

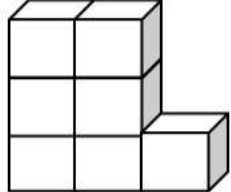
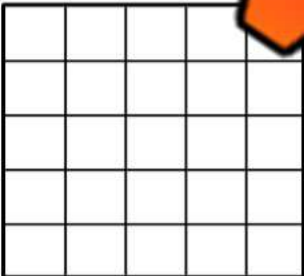
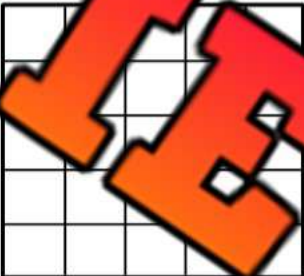
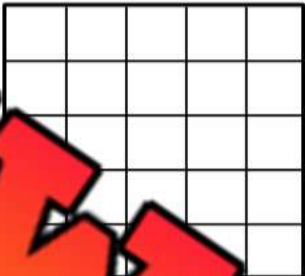
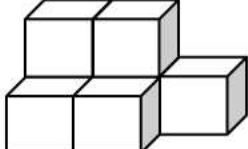
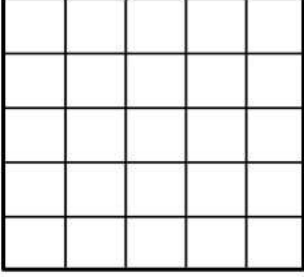
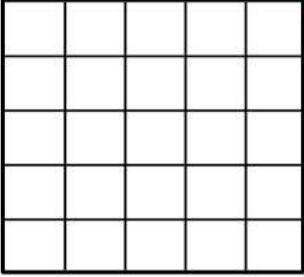
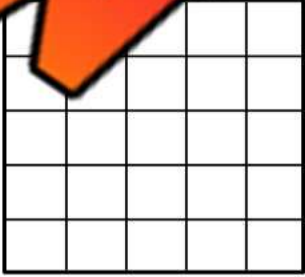
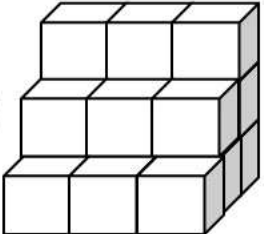
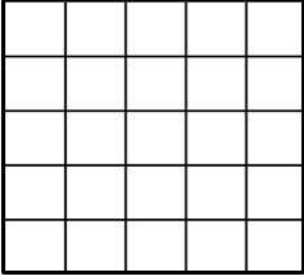
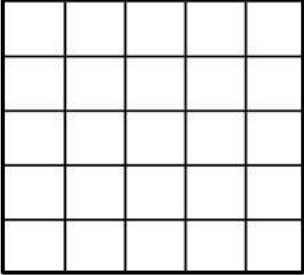
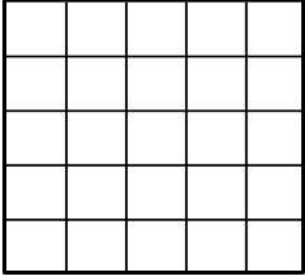
Look at the front, top, and side views and circle the matching 3D object

Top View	Front View	Side View
		
		

Top View	Front View	Side View
		
		

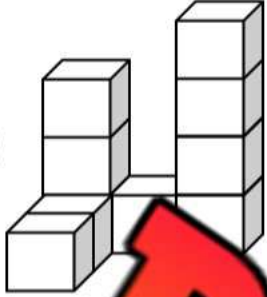
Part 2

Draw the front, top, and side view of the objects below

Original Shape	Top View	Front View	Side View
1) 			
2) 			
3) 			

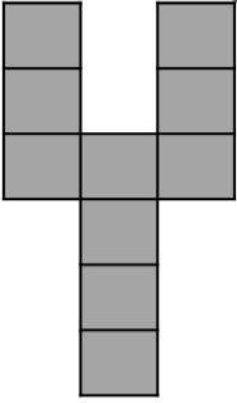
Part 3

Draw the top, front, and side view of the objects below

Original Shape	Top View	Front View	Side View
1) 			

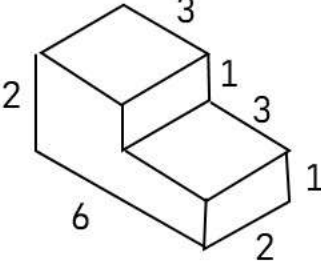
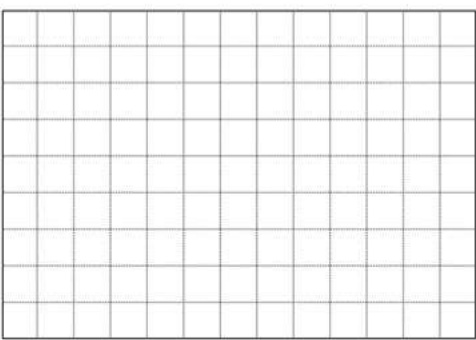
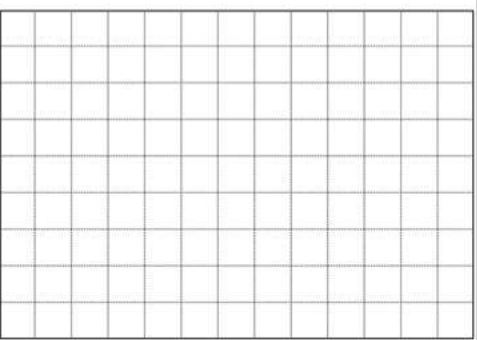
Part 4

Draw the isometric view of the letter. Use a scale of 1:1.

Letter	Front View	Isometric View
Y		

Part 5

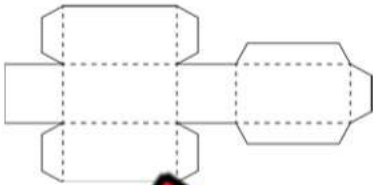
Draw the top, front, and side views of the isometric drawing

Isometric View	Cavalier	Cabinet
2) 		

Part 6

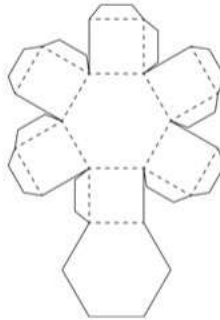
Identify and circle the 3D object formed by each net

1)



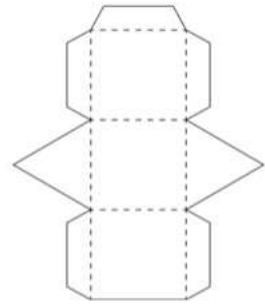
- Rectangular Prism
- Cylinder
- Cube

2)



- Rectangular Prism
- Pentagonal Prism
- Hexagonal Prism

3)

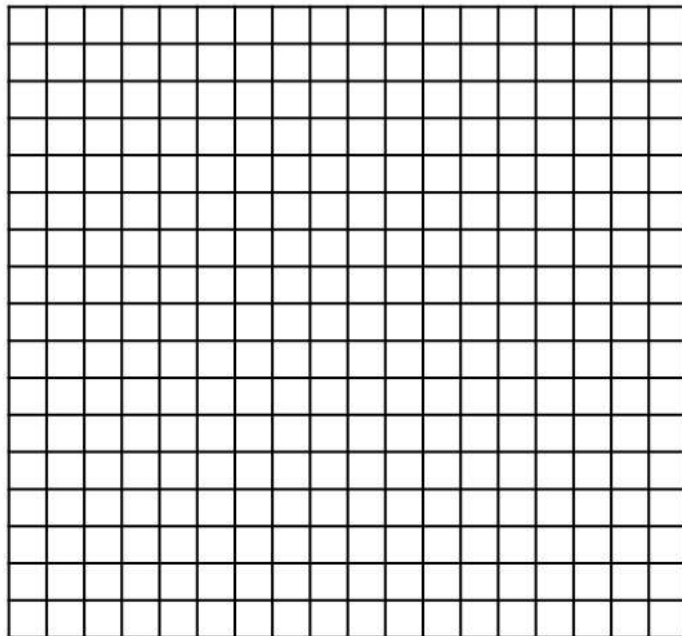
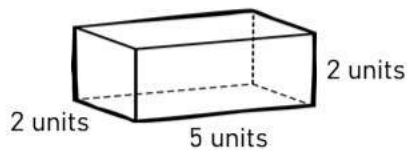


- Rectangular Prism
- Pentagonal Prism
- Triangular Prism

Part 7

Draw the 3D object on the grid below the dimensions provided

1) Rectangular Prism



2) Rectangular Prism

