

Nets and Surface Area

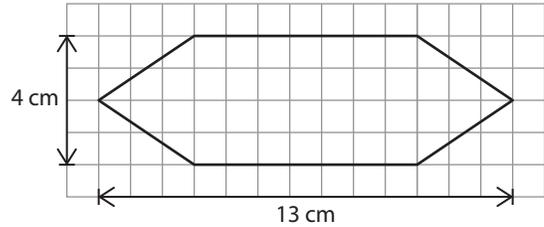
Name: _____

Prerequisite: Area of Polygons

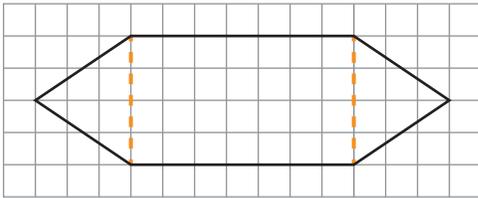
Study the example problem showing how to find the area of a polygon. Then solve problems 1–8.

Example

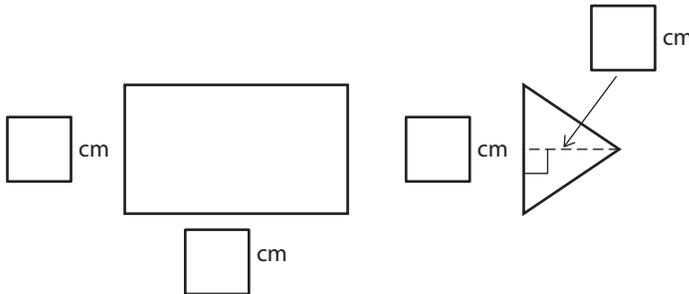
Gary drew a picture of a nameplate that he plans to make. He wants to find the area of the nameplate. How could Gary break apart the figure to find its area?



Gary separates the figure he drew into two triangles and a rectangle.



- 1** Label the dimensions of the rectangle and one of the triangles.



- 2** What is the area of the rectangle?

- 3** What is the area of the triangle?

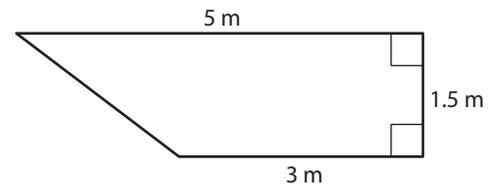
- 4** What is the area of the nameplate? Write an equation to show your solution.



Solve.

Use the trapezoid to solve problems 5–6.

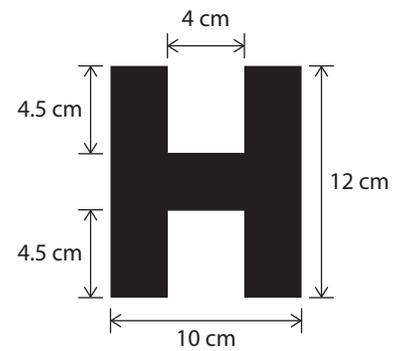
- 5 Separate the trapezoid into figures whose areas you can find. Label the dimensions.
- 6 What is the area of the trapezoid?



Solution: _____

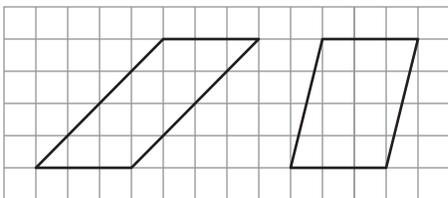
- 7 Hector drew three rectangles to show the letter H on his notebook. Use the rectangles to find the area of the letter he drew.

Show your work.



Solution: _____

- 8 Pat says that the parallelograms below do not have the same area. Is she correct? Explain.

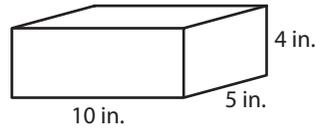


Surface Area of a Rectangular Prism

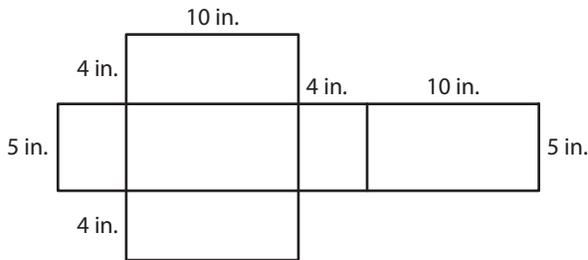
Study the example showing how to find the surface area of a rectangular prism. Then solve problems 1–8.

Example

Kanene wants to know how much wrapping paper she needs to cover this box. How much wrapping paper does she need?



You can use a net to help you solve the problem.



1 Complete the table to find the area of each face.

Face	Length (in.)	Width (in.)	Area (sq in.)
Top	10	5	
Bottom			
Front			
Back			
Right side			
Left side			

2 Which pairs of faces have the same areas?

3 What is the surface area of the box? Use your answer to problem 2 to write an equation.

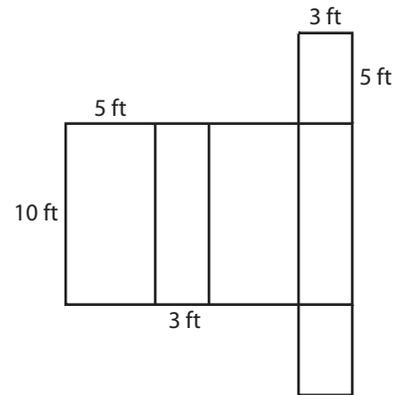
4 What is the relationship between the surface area of a rectangular prism and the area of each face?



Solve.

- 5 Carl drew this net for a wooden shed that he will build. He wants to protect the wood against the weather by using a sealant on all of the outside surfaces, including the bottom. Will a container of sealant that covers 200 square feet be enough to protect the outside surfaces?

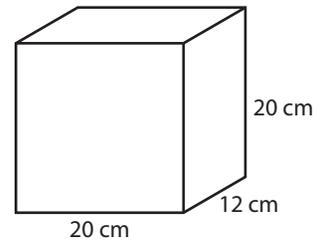
Show your work.



Solution: _____

- 6 Susana is making a small box. The 20-cm by 20-cm front of the box will be glass. The other faces will be wood. How much wood does Susana need to make the box?

Show your work.



Solution: _____

- 7 The surface area of a cube is 216 square meters. What is the height of the cube? Explain.

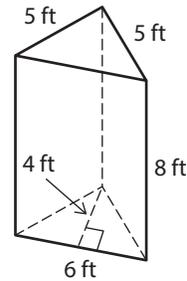
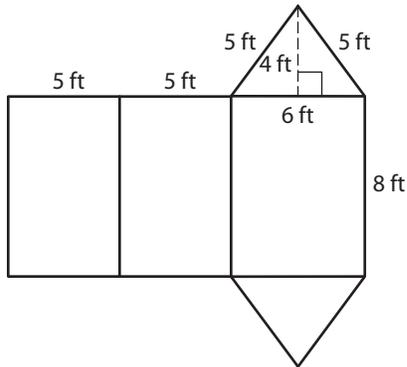
- 8 Mike says that if he doubles each dimension of any rectangular prism, the surface area also doubles. Is Mike correct? Give an example to support your answer.

Surface Area of a Triangular Prism

Study the example showing how to find the surface area of a triangular prism. Then solve problems 1–7.

Example

What is the surface area of the triangular prism shown? You can draw and label a net of the prism to help you.



1 Complete the table to find the area of each face.

Face	Base (ft)	Height (ft)	Area (sq ft)
Triangle	6	4	
Triangle			
Rectangle			
Rectangle			
Rectangle			

2 Why do the rectangular faces have different areas?

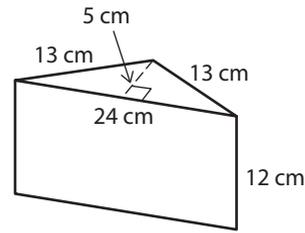
3 What is the surface area of the triangular prism? Write two equations to represent the surface area.



Solve.

Use the following situation to solve problems 4–6.

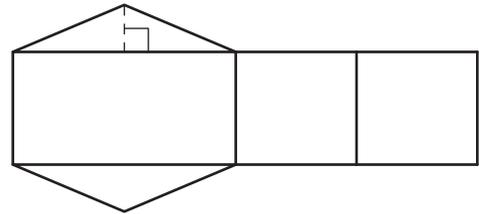
Jane is decorating a paperweight in the shape of a triangular prism. The diagram shows its dimensions.



4 Label the net of the triangular prism to show the dimensions of the faces.

5 What is the surface area of the paperweight?

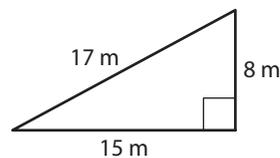
Show your work.



Solution: _____

6 Amad used the expression $2\left(\frac{1}{2} \cdot 24 \cdot 5\right) + 3(13 \cdot 12)$ to find the surface area of the paperweight. What is wrong with his expression? Correct Amad's mistake.

7 The picture shows the dimensions of one base of a triangular prism. The height of the prism is 2 meters. What is the surface area of the triangular prism? Explain how to find the answer.



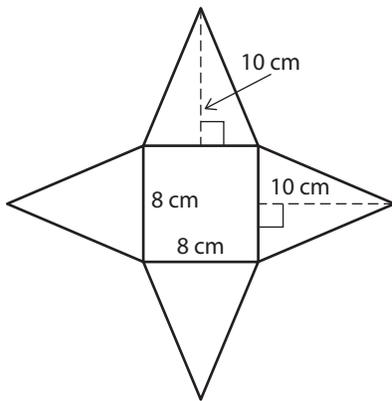
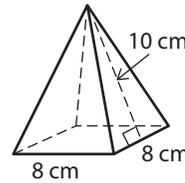
Surface Area of a Pyramid

Study the example problem showing how to find the surface area of a pyramid. Then solve problems 1–8.

Example

What is the surface area of the pyramid?

You can draw and label a net to help you.



1 Complete the table to find the area of each face.

Face	Base (cm)	Height (cm)	Area (sq cm)
Triangle	8	10	
Triangle			
Triangle			
Triangle			
Square			

2 Describe the number of faces and their shapes.

3 Use formulas to explain how to find the area of each face.

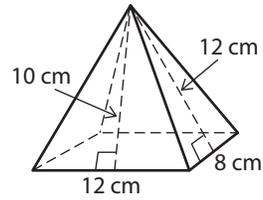
4 What is the surface area of the pyramid? Write an equation to represent the surface area.



Solve.

Use the following situation to solve problems 5–7.

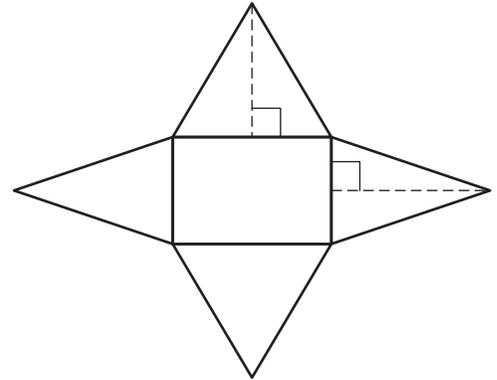
Marcos is making a pyramid in his wood shop class. The base of the pyramid is a rectangle.



5 Label the net of the pyramid with the dimensions of the faces.

6 What is the surface area of the pyramid?

Show your work.



Solution: _____

7 Yolanda used the expression $\left(\frac{1}{2} \cdot 12 \cdot 10\right) + \left(\frac{1}{2} \cdot 8 \cdot 12\right) + (12 \cdot 8)$ to find the surface area of the pyramid. What is wrong with the expression? Correct Yolanda's mistake.

8 The surface area of a pyramid is 540 square inches. Its base is a square with a side length of 10 inches. What is the height of one of the triangular faces of the pyramid? Explain how to find the answer.

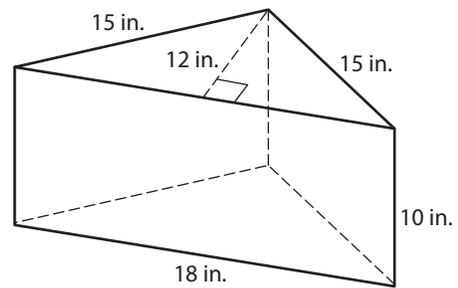
Nets and Surface Area

Solve the problems.

- 1** Rita keeps her craft supplies in a container without a top. The container is a triangular prism. Rita plans to cover the outside of the container with decorative paper. How much paper does she need?

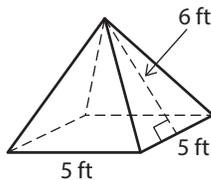
Show your work.

How many faces should you include in your calculations?



Solution: _____

- 2** Look at the pyramid below.



What do you need to know to find the surface area of a pyramid?



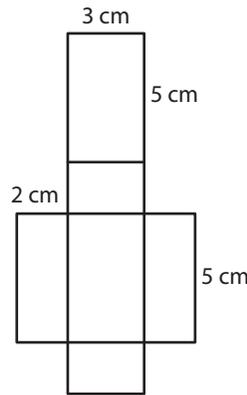
Tell whether each statement about the pyramid is *True* or *False*.

- | | | |
|---|-------------------------------|--------------------------------|
| a. The area of each triangular face is 30 square feet. | <input type="checkbox"/> True | <input type="checkbox"/> False |
| b. The surface area of the pyramid is 85 square feet. | <input type="checkbox"/> True | <input type="checkbox"/> False |
| c. A net of the pyramid would have three triangular faces. | <input type="checkbox"/> True | <input type="checkbox"/> False |
| d. The area of the base is 25 square feet. | <input type="checkbox"/> True | <input type="checkbox"/> False |



Solve.

- 3** The net represents a rectangular prism. Which expression represents the surface area? Select all that apply.



How do you find the surface area of a rectangular prism?



- A** $(3 \cdot 5) + (5 \cdot 2) + (2 \cdot 3)$
- B** $15 + 15 + 6 + 6 + 10$
- C** $2(3 \cdot 5) + 2(3 \cdot 2) + 2(2 \cdot 5)$
- D** $2(10) + 2(6) + 2(15)$

Horus chose **A** as the correct answer. How did he get that answer?

- 4** Does the diagram represent the net of a triangular prism? Choose *Yes* or *No*.

a. Yes No

b. Yes No

c. Yes No

How many faces on a triangular prism are triangles?



- 5** Design your own pyramid. Describe your pyramid, and then choose its dimensions and find its surface area.
