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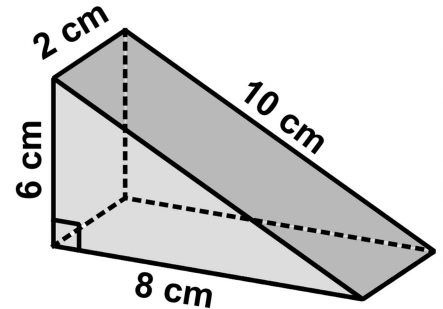
SURFACE AREA N-GEN MATH[®] 6



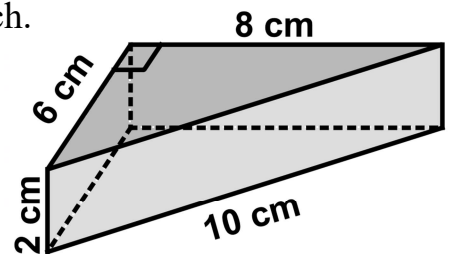
All the solids you have studied so far are known as **polyhedrons** which simply means that all of their faces are **polygons**, i.e. figures like triangles, quadrilaterals, pentagons, etcetera. Each of these faces is **two-dimensional** (flat) in nature. In this lesson we will look at the area of these faces.

Exercise #1: A right triangular prism is shown below in two different views.

- (a) How many faces does this polyhedron have?
- (b) How do you know that the **lateral faces** of this polyhedron are rectangles?



- (c) Draw each of the faces below and show the dimensions of each.



- (d) Find the **area** of each face and sum. This is known as the **surface area** of the solid.

WHAT IS SURFACE AREA?

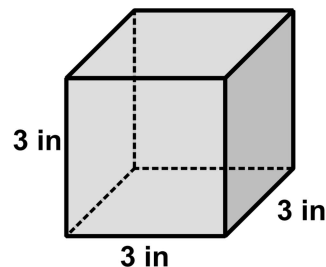
Surface area is the sum of all areas of the polygons that make up the faces of a solid.



A useful tool to help visualize surface area is the **net of the solid**. A **net** can be thought of as the **two-dimensional** figure that is created by “unwrapping” the sides of the solid.

Exercise #2: Let’s consider the simple cube shown.

(a) How many faces does a cube have? Each face is what type of figure?

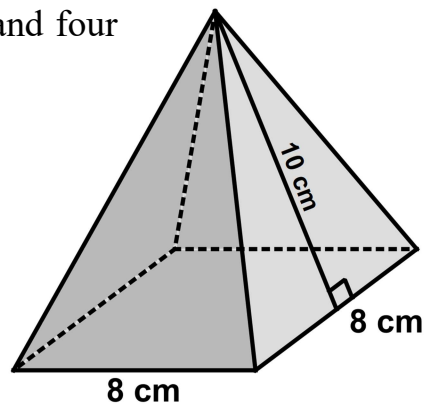


(b) Draw a net of the cube (there are many). Imagine making cuts along certain edges that would allow you to unfold the faces without them falling apart.

(c) What is the common area of each face? What is the surface area of the cube?

Exercise #3: A rectangular pyramid is shown with a square base and four identical isosceles triangles.

(a) Draw a net below for this solid.



(b) Find the area of each polygon in the net and the sum to find the surface area of the solid.



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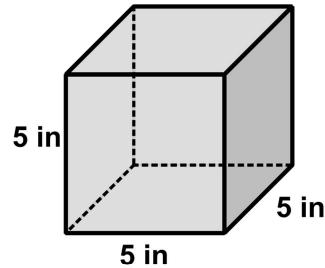
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SURFACE AREA N-GEN MATH[®] 6 HOMEWORK

FLUENCY

1. The surface area of a cube whose edges have lengths of 5 inches each is equal to which of the following?

- (1) 25 square inches
- (2) 75 square inches
- (3) 125 square inches
- (4) 150 square inches

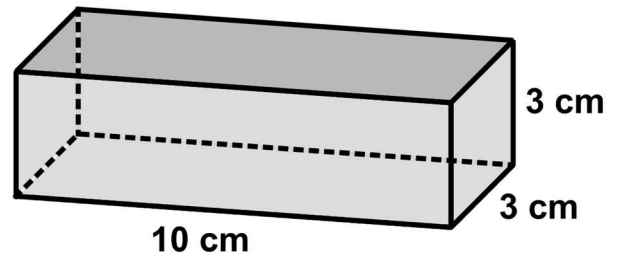
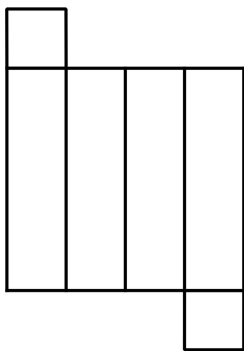


2. Unwrapping the faces of a solid into a two-dimensional pattern is known as creating which of the following?

- (1) a wrap
- (2) a ring
- (3) a net
- (4) a cover

3. A right rectangular prism is shown to the right.

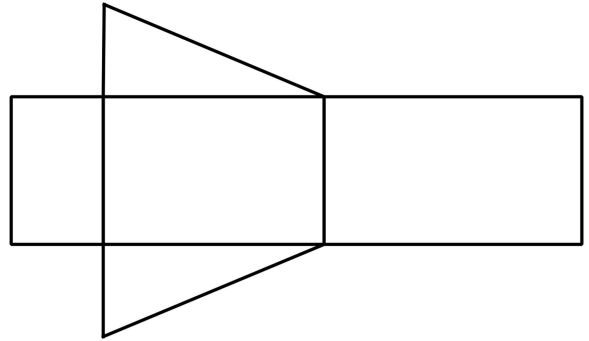
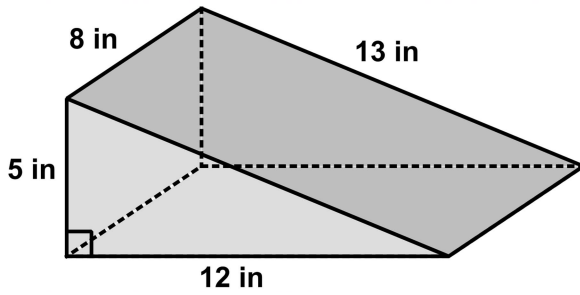
- (a) One possible net for this solid is shown below. Create two additional nets.



- (b) Find the surface area of the solid. Show your work below.



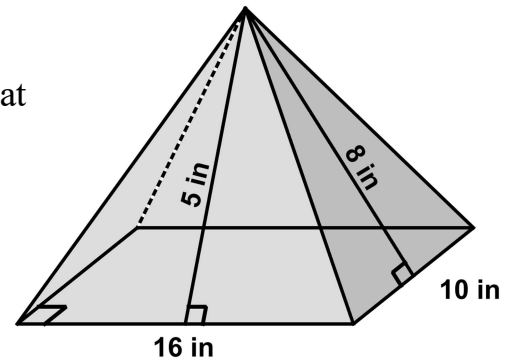
4. The image below shows a right triangular prism and one possible net for the figure.



- (a) On the image of the net above, label the dimensions of the various rectangles and triangles that make it up.
- (b) Find the area of each of the five shapes in the net above and sum to find the surface area of the solid. Show your work and use correct units when expressing your answer.

5. A right pyramid has a base that is a rectangle.

- (a) Draw a net that shows the two-dimensional shapes that cover this solid.



- (b) Your net should include five shapes. Find the areas of each and sum to find the surface area of the pyramid. Show your work and use appropriate units in your answer.

