



Math Virtual Learning

6th Grade Math

Surface Area of Triangular Prisms and Pyramids

April 29, 2020



6th Grade Math
Lesson: April 29, 2020

Objective/Learning Target:

Students will use nets to find the surface area of triangular prisms and pyramids.

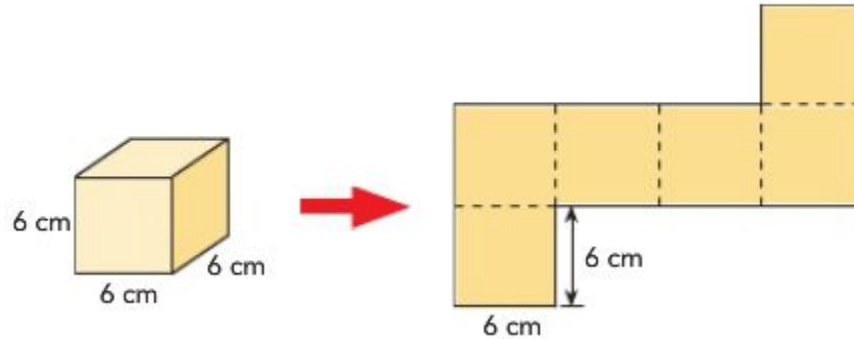
Bell Ringer:

Let's Get Started!

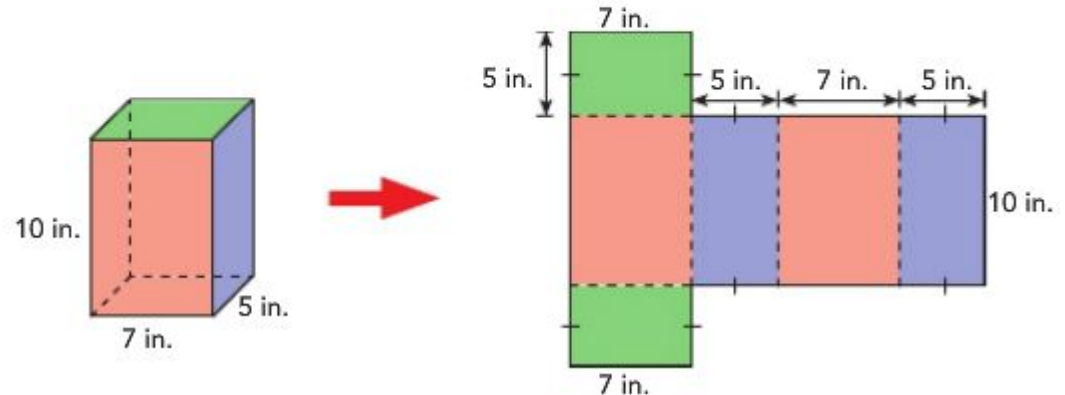
Watch This Video:

[Surface Area of Triangular Prisms](#)

- 1 A cube has edges measuring 6 centimeters each. Find the surface area of the cube.



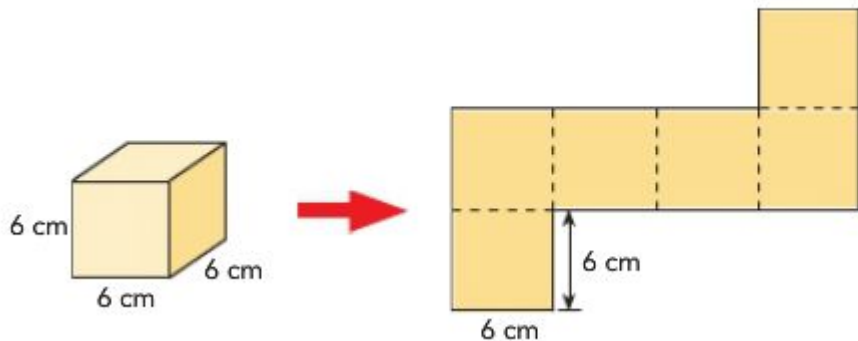
- 2 A rectangular prism measures 7 inches by 5 inches by 10 inches. Find the surface area of the prism.



Bell Ringer:

(Answer Key)

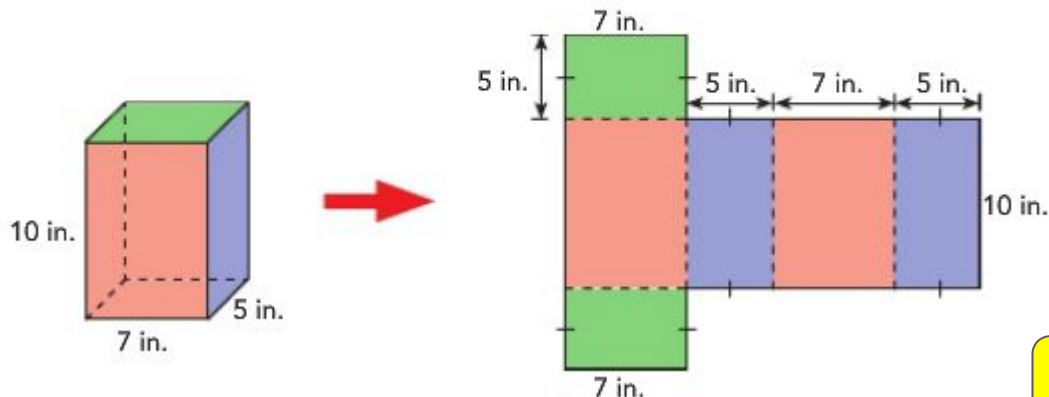
- 1 A cube has edges measuring 6 centimeters each. Find the surface area of the cube.



Area of one square face:
 $6 \times 6 = 36 \text{ sq. cm}$

Area of all faces:
 $36 \times 6 = 216 \text{ sq. cm}$

- 2 A rectangular prism measures 7 inches by 5 inches by 10 inches. Find the surface area of the prism.



Area of first rectangular face:
 $5 \times 7 = 35 \text{ sq. cm}$

Area of second rectangular face:
 $10 \times 7 = 70 \text{ sq. cm}$

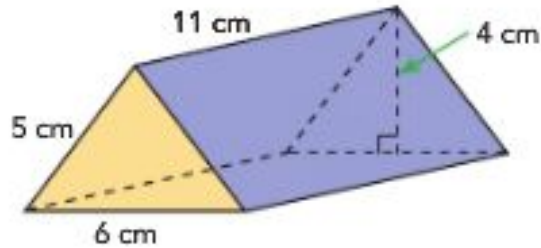
Area of third rectangular face:
 $5 \times 10 = 50 \text{ sq. cm}$

Area of all faces:
 $(35 + 70 + 50) \times 2 = 310$

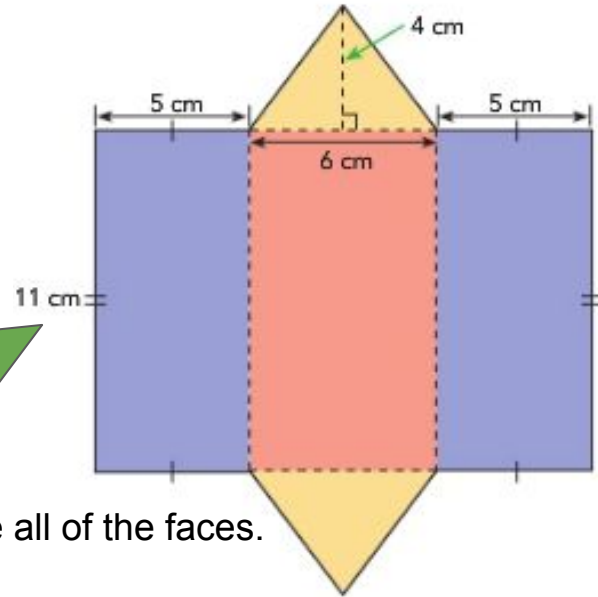
You multiply the sum by 2, because each face is congruent with the opposite face.

Learn:

The triangular prism shown has three rectangular faces. Its bases are congruent isosceles triangles. Find the surface area of the triangular prism.



This is the net of the triangular prism. The surface area of a triangular prism is its net.



To find the total surface area, first find the area of the all of the faces.

$$11 \times 5 = 55; \text{ there are two of these so } 55 \times 2 = 110$$

$$11 \times 6 = 66; \text{ there is only one of these so } 66$$

$$\frac{1}{2} (6 \times 4) = 12; \text{ there are two of these so } 12 \times 2 = 24$$

Then add the three products to find the total surface area.

$$110 + 66 + 24 = 200 \text{ sq. cm}$$

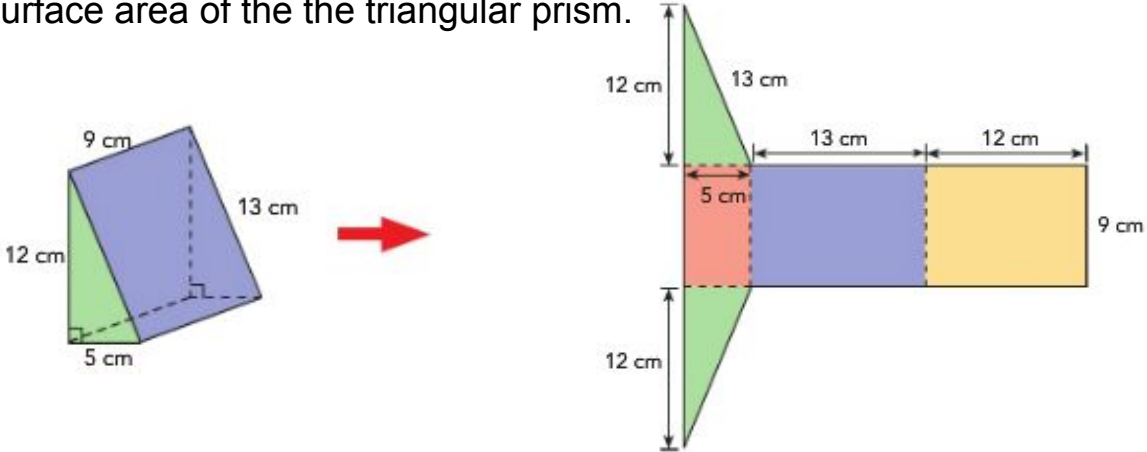
Remember:

$$\text{Area of a triangle} = \frac{1}{2}bh$$

$$\text{Area of a rectangle} = l \times w$$

Practice:

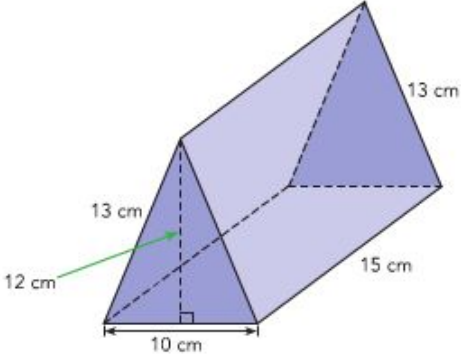
The triangular prism shown has three rectangular faces. Its bases are congruent right triangles. Find the surface area of the the triangular prism.



To find the total surface area, first find the area of the all of the faces.

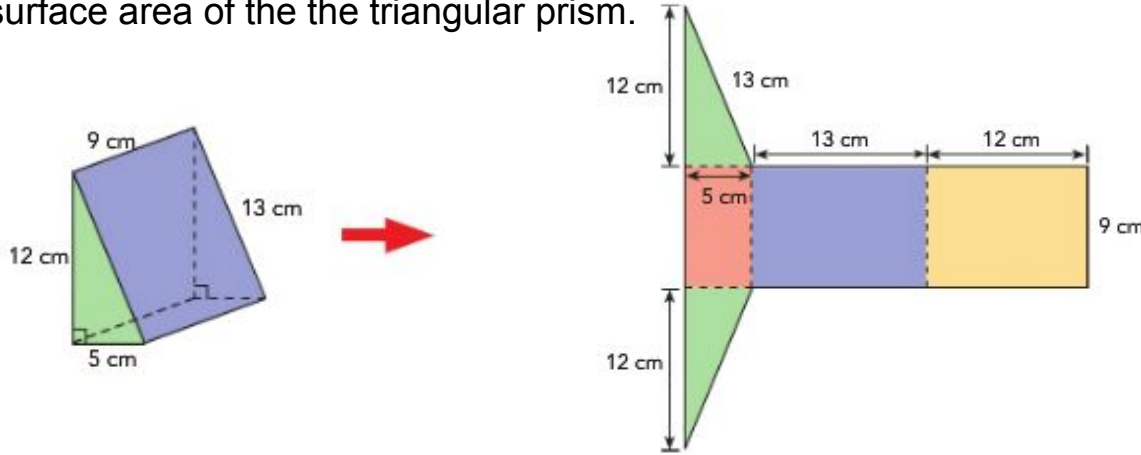
Then add the products together to find the total surface area.

A triangular prism with its measurements is shown. Find the surface area of the prism.



Practice: (Answer Key)

The triangular prism shown has three rectangular faces. Its bases are congruent right triangles. Find the surface area of the the triangular prism.



To find the total surface area, first find the area of the all of the faces.

$$5 \times 9 = 45$$

$$13 \times 9 = 117$$

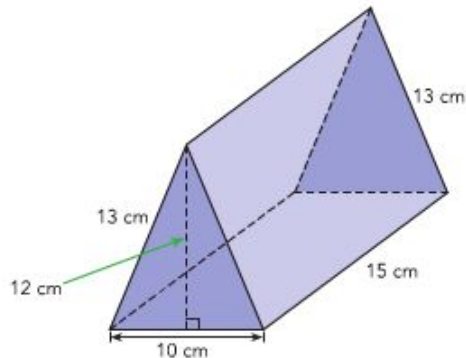
$$12 \times 9 = 108$$

$$\frac{1}{2} (5 \times 12) = 30 \times 2 = 60$$

Then add the products together to find the total surface area.

$$45 + 117 + 108 + 60 = 330 \text{ sq. cm}$$

A triangular prism with its measurements is shown. Find the surface area of the prism.



To find the total surface area, first find the area of the two triangles and the three rectangles.

$$\frac{1}{2} (10 \times 12) = 60; \text{ there are two of these so } 60 \times 2 = 120$$

$$15 \times 13 = 195; \text{ there are two of these so } 195 \times 2 = 390$$

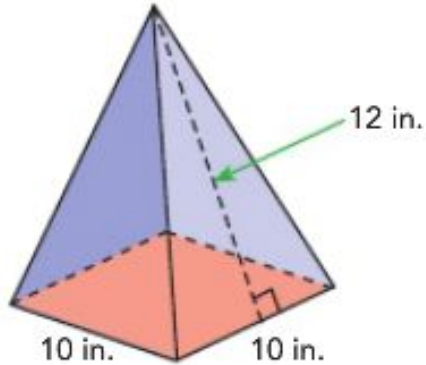
$$10 \times 15 = 150$$

Then add the products together to find the total surface area.

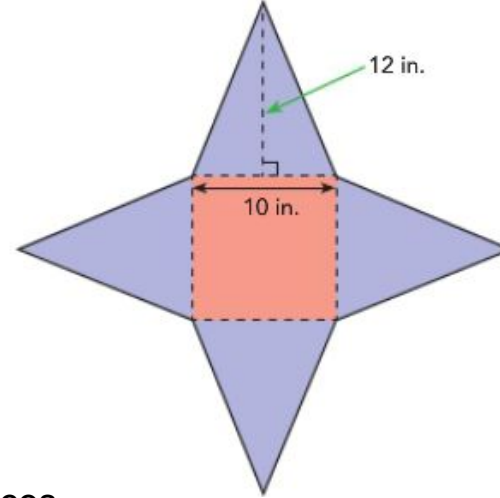
$$120 + 390 + 150 = 660 \text{ sq. cm}$$

Learn:

This pyramid has a square base measuring 10 inches on each side. It has four faces that are congruent isosceles triangles. The height of each triangle is 12 inches. Find the surface area.



This is the net of the square pyramid. The surface area of a square pyramid is its net.



To find the total surface area, first find the area of the all of the faces.

The area of the square base: $10 \times 10 = 100$

The area of the triangle: $\frac{1}{2} (10 \times 12) = 60$; there are four of these so $60 \times 4 = 240$

Then add the area of the faces together to find the total surface area.

$$100 + 240 = 340 \text{ sq. in}$$

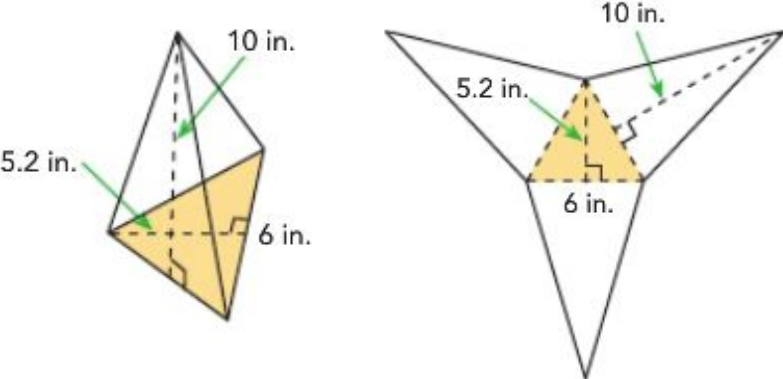
Remember:

Area of a triangle = $\frac{1}{2} bh$

Area of a rectangle = $l \times w$

Practice:

Alicia makes a pyramid that has an equilateral triangle as its base. The other three faces are congruent isosceles triangles. She measures the lengths shown on the net of her pyramid. Find the surface area of the pyramid.

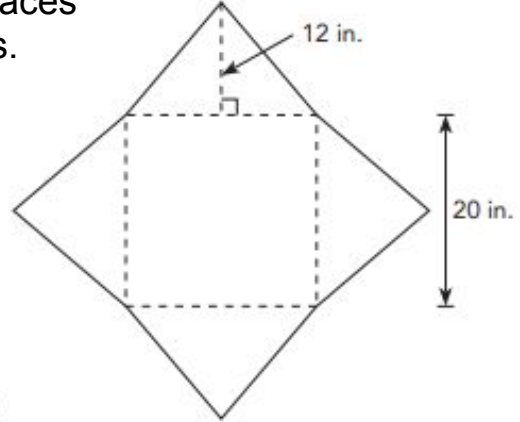


An isosceles triangle has two equal sides and two equal angles.

To find the total surface area, first find the area of the all of the faces.

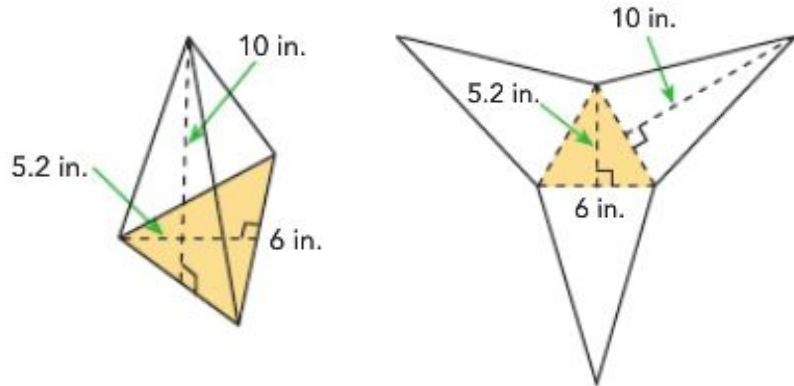
Then add the products together to find the total surface area.

The pyramid has square base measuring 20 inches on each side. It has four faces that are congruent isosceles triangles. The height of each triangle is 12 inches. Find the surface area of the pyramid.



Practice: (Answer Key)

Alicia makes a pyramid that has an equilateral triangle as its base. The other three faces are congruent isosceles triangles. She measures the lengths shown on the net of her pyramid. Find the surface area of the pyramid.



An isosceles triangle has two equal sides and two equal angles.

To find the total surface area, first find the area of the all of the faces.

$$\frac{1}{2} (6 \times 5.2) = 15.6$$

$$\frac{1}{2} (6 \times 10) = 30 \times 3 \text{ (triangles)} = 90$$

Then add the products together to find the total surface area.

$$15.6 + 90 = 105.6 \text{ sq. in.}$$

The pyramid has square base measuring 20 inches on each side. It has four faces that are congruent isosceles triangles. The height of each triangle is 12 inches. Find the surface area of the pyramid.

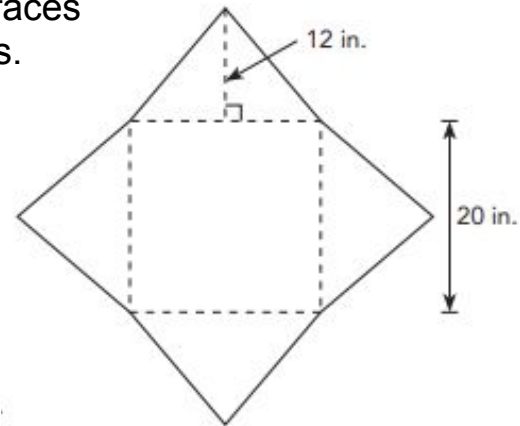
To find the total surface area, first find the area of the square base and the area of the four triangles.

$$20 \times 20 = 400$$

$$\frac{1}{2} (20 \times 12) = 120 \times 4 \text{ (triangles)} = 480$$

Then add the products together to find the total surface area.

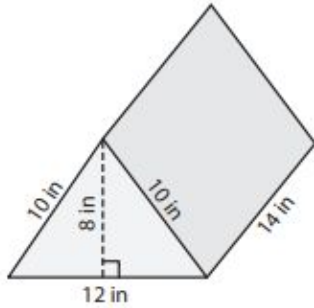
$$400 + 480 = 880 \text{ sq. in.}$$



Additional Practice:

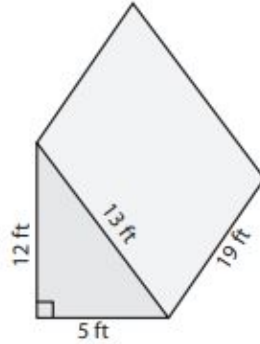
Find the surface area for each shape.

1)



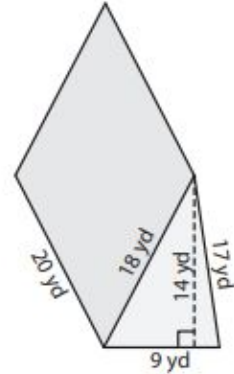
Surface Area = _____

2)



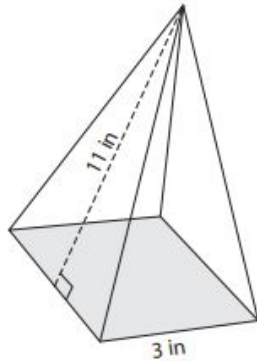
Surface Area = _____

3)



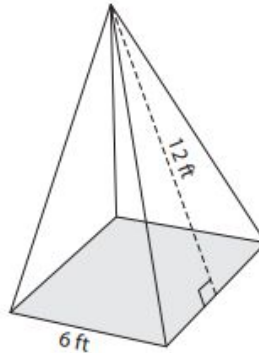
Surface Area = _____

4)



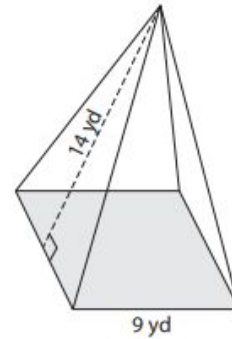
Surface Area = _____

5)



Surface Area = _____

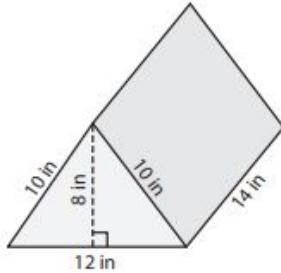
6)



Surface Area = _____

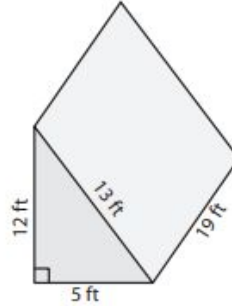
Additional Practice: *(Answer Key)*

1)



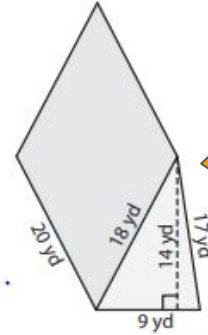
Surface Area = 544 in²

2)



Surface Area = 630 ft²

3)



Surface Area = 1,006 yd²

Area of Rectangles:

$$20 \times 18 = 360$$

$$20 \times 17 = 340$$

$$20 \times 9 = 180$$

Area of Triangles:

$$\frac{1}{2} \times 14 \times 9 = 63$$

$$\frac{1}{2} \times 14 \times 9 = 63$$

Total Surface Area:

$$360 + 340 + 180 + 63$$

$$+ 63 = 1006 \text{ sq. yd.}$$

Area of Square:

$$3 \times 3 = 9$$

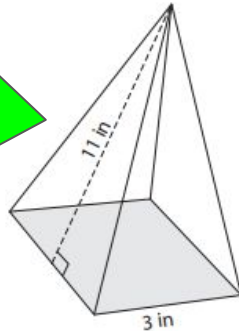
Area Each Triangle:

$$\frac{1}{2} \times 11 \times 3 = 16.5$$

Total Surface Area:

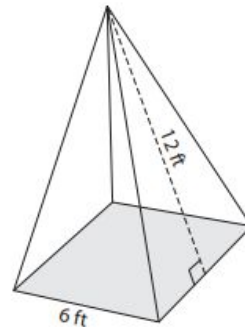
$$9 + 4(16.5) = 75 \text{ sq. in.}$$

4)



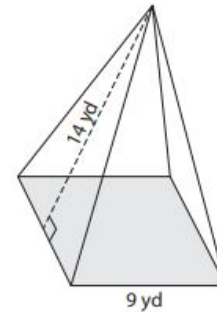
Surface Area = 75 in²

5)



Surface Area = 180 ft²

6)



Surface Area = 333 yd²

Additional Resources:

Click on the links below to get additional practice and to check your understanding!

[IXL: Surface Area of Triangles](#)

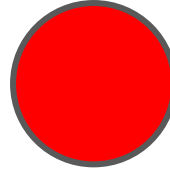
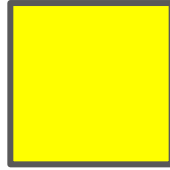
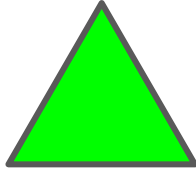
[Quizizz: Surface Area of Triangles](#)

[Tutorialspoint: Surface Area of Triangles](#)

[Khan Academy: Surface Area Practice](#)

Reflection:

Complete the triangle-square-circle reflection for today's lesson.



**What were the
three main
points of today's
lesson?**

**What squared
(made sense)
with you from
today's lesson?**

**What questions
do you still have
circling around
in your head?**