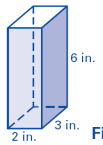
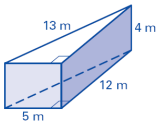
9.3 Surface Area of Pyramids and Cones

GOAL Find the surface areas of pyramids and cones.

Warm Up

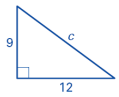
Find the surface area of the prism.

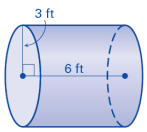
1. 

2. 

Find the surface area of the cylinder. Round your answer to the nearest whole number.

Find the missing length.

3. 

4. 

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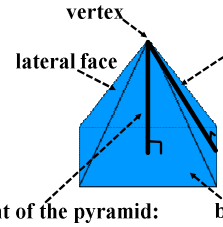
Vocabulary:

A pyramid: a polyhedron in which the base is a polygon and the lateral faces are triangles with a common vertex.



slant height of the pyramid(*l*): the height of one of the lateral faces. It is always found on the *outside* of the pyramid.

height of the pyramid: the perpendicular distance between the vertex and the base. This length is *always inside* the pyramid

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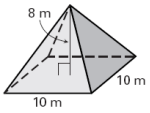
Surface area of a pyramid: Lateral Area + area of the base

S.A. of pyramid: one-half (perimeter of the base)(slant height) + area of the base

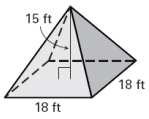
S.A. = 1/2 p *l* + *B*

Find the slant height of the pyramid.



Find the Surface Area of a Pyramid

Find the surface area of the pyramid. Round your answer to the nearest whole number.



Find the perimeter of the base:

Find the slant height:

$(\text{height})^2 + (1/2 \text{ side})^2 = (\text{slant height})^2$

Find the area of the base:

Plug the values into the formula:

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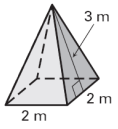
Find the surface area of the pyramid. Round your answer to the nearest whole number.



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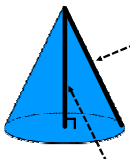
A cone has a circular base and a vertex that is not in the same plane as the base



slant height if the cone: the distance between the vertex and a point on the base edge.

height of the cone: the perpendicular distance between the vertex and the base

Surface Area of a Cone: Lateral Area + Area of the base

Surface Area of a Cone: π(radius of the base)(slant height)+area of the base

S. A. : $\pi rl + \pi r^2$

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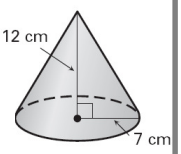
Find the Slant Height

Find the slant height of the cone. Round your answer to the nearest whole number.

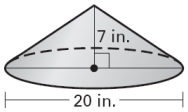


SOLUTION

The slant height is the length of the hypotenuse of the triangle formed by the height and the radius.

$(\text{radius})^2 + (\text{height})^2 = (\text{slant height})^2$

Find the Slant Height



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Find the Surface Area of a Cone

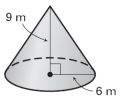
Find the surface area of the cone with a radius of 7 centimeters and a slant height of 12 centimeters. Round your answer to the nearest whole number.

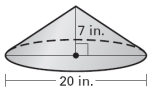
Write the formula for surface area of a cone.

Substitute.

Simplify.

Find the surface area of the cone. Round your answer to the nearest whole number.





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