Math 9
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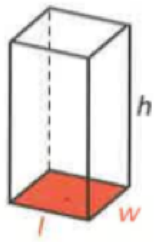
8.4/8.5 Volume and Surface Area of Cones

Part A: Review of what we know so far:

_____ is the measure of how much space a three dimensional object occupies.

The _____of an object is the sum of the areas of its outside surfaces. (How much material is needed to build an object)



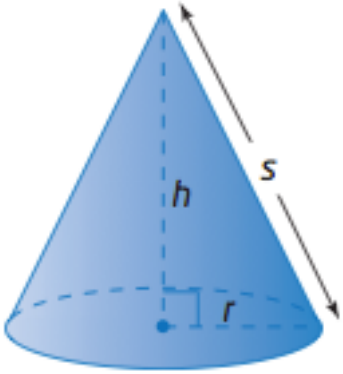
Volume of a prism = _____ x _____

Volume of pyramid = _____

Part B: Volume of a Cone

The volume of a cone is $\frac{1}{3}$ the volume of a cylinder with the same base and height; therefore the formula for the volume of a cone is:

$Volume_{cone}$ = _____ or _____



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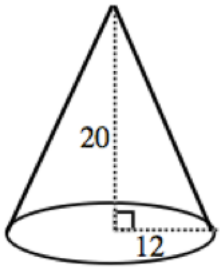
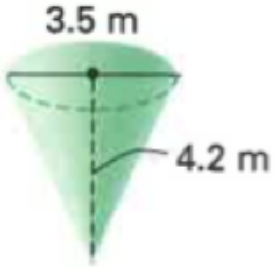
Example 1: Find the volume of the following cone:



Volume$_{cone}$= _____

Example 2: Find the volume of the following cone:

Remember:
$d = 2r$



Volume$_{cone}$= _____

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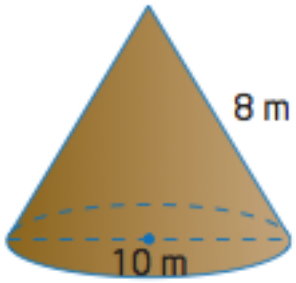
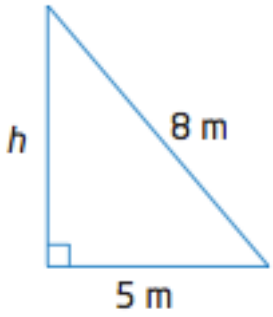
Example 3: A conical pile of sand has a base diameter of 10 meters and a slant height of 8 meters. Determine the volume of the sand pile, to the nearest cubic meter.



Since the diameter of the base is 10m, the radius is _____.

To determine the volume of the cone, we need to determine the **height**. Apply the Pythagorean theorem:

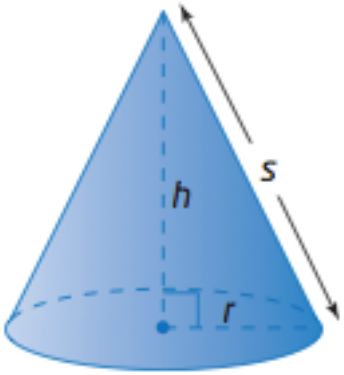
Height:



Volume:

Part C: Surface Area of a Cone

$$Surface\ Area_{cone} = \pi rs + \pi r^2$$



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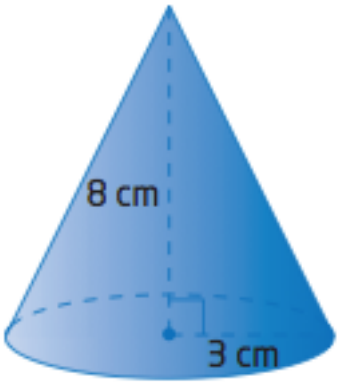
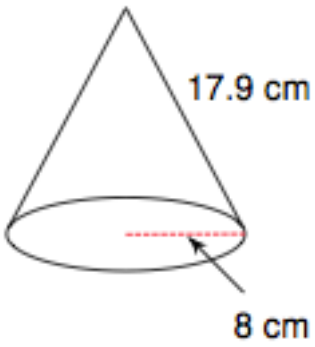
Example 4: Calculate the surface area of the cone, to the nearest square centimeter.

Start by finding the slant height by using the Pythagorean Theorem:



Now find the surface area of the cone:

Example 5: Calculate the surface area of the cone, to the nearest square centimeter.



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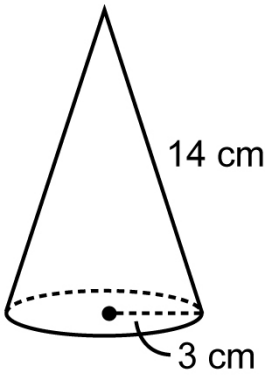
Part D: Show me what you've learned

Find the volume and surface area of the following cone:



Volume = _____

Surface Area = _____