

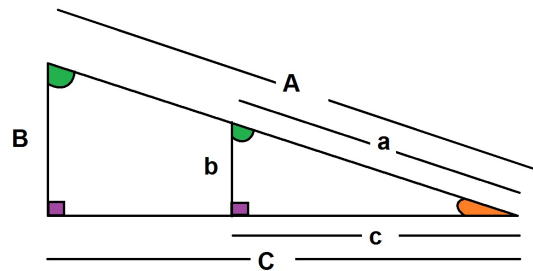
Worksheet for Week 7: Geometry Review

Many of the story problems will require writing down functions using **geometry**. You need **area** and **volume** equations, the **Pythagorean Theorem**, definitions of the **trigonometric functions** on the right triangle and **similar triangles**. This worksheet covers geometry of triangles.

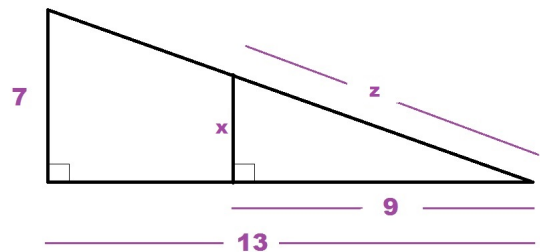
1. Using Similar Triangles

Similar triangles have a common ratio for their corresponding sides, opposite the angles with the same measures. In particular, when one right triangle sits inside another, the two triangles are similar so you get the ratios:

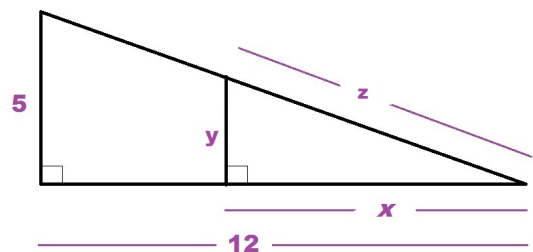
$$\frac{A}{a} = \frac{B}{b} = \frac{C}{c}$$



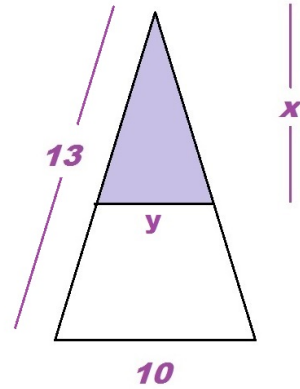
- (a) Use the fact that two right triangles are similar to compute x and z .



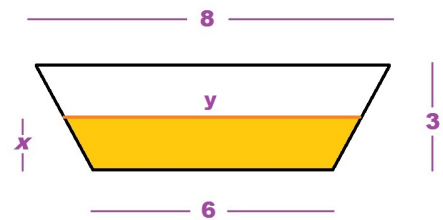
- (b) Use the fact that two right triangles are similar to compute y and z in terms of x .



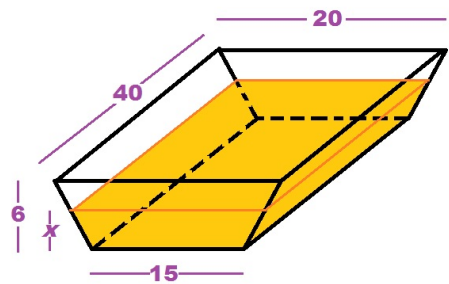
- (c) Find y in terms of x . You need right triangles to get started on this one.



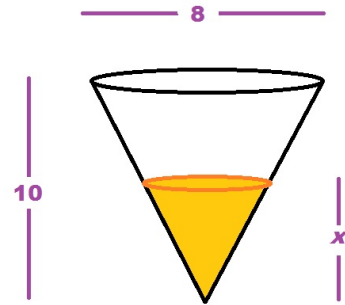
- (d) Find the area of the shaded region in terms of x . You need right triangles to get started on this one, too.



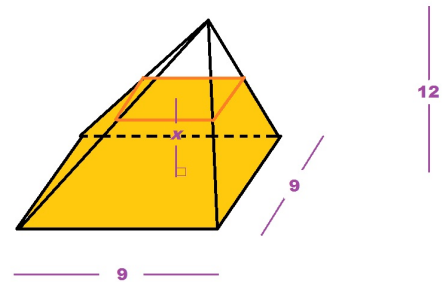
- (e) The tank shown on the right is filled with water to a depth x . Find the volume of water in the tank in terms of x and the total volume of the tank. Remember to compute the volume you multiply base area by height. Which one is the base?



- (f) The tank shown on the right is filled with water to a depth x . Find the volume of water in the tank in terms of x and the total volume of the tank. What is the formula for the volume of a cone?

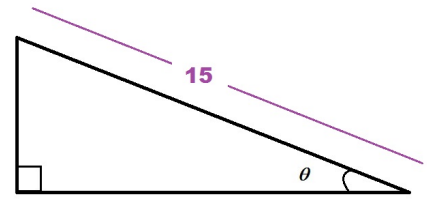


- (g) The tank shown on the right is filled with water to a depth x . Find the total volume of the tank and the volume of water in the tank in terms of x . What is the formula for the volume of a pyramid?



2. **Circles and Angles** - For this question you will need the trigonometric functions. Remember that we always use RADIANS for angles in calculus.

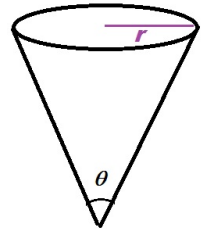
- (a) Find the area and the perimeter of the triangle.



- (b) Find the area and the perimeter of the trapezoid.



- (c) Find the volume of the cone in terms of r and θ .



- (d) Find x given that the radius of the circle is 5 units long.

