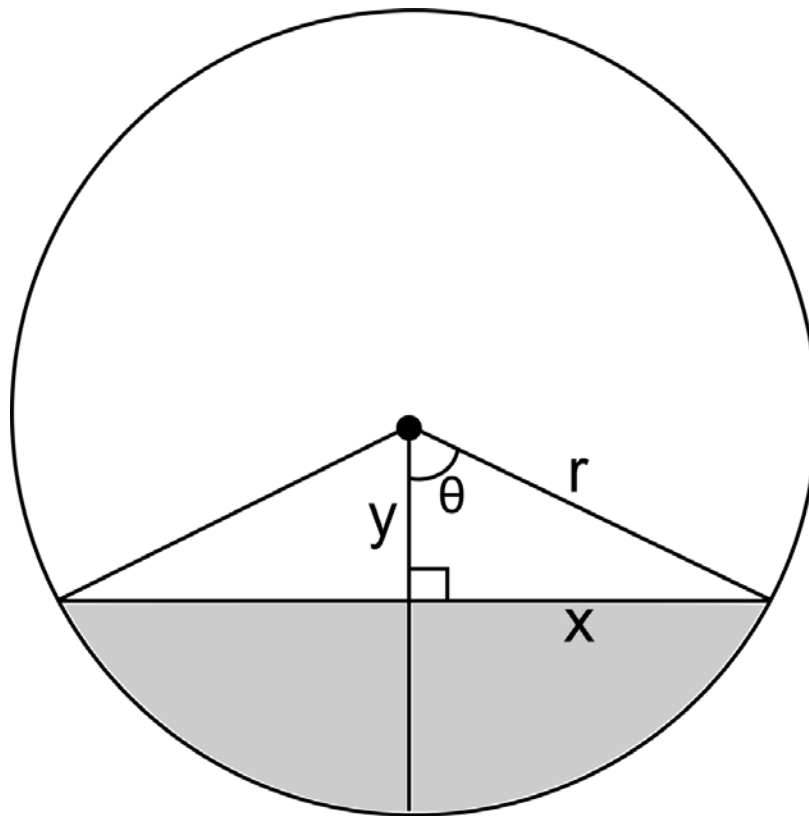


A truck has a fuel tank which is a 20 inch diameter cylinder resting on its rounded side. The driver notices that his fuel gauge is no longer giving the correct readings, so he has to improvise. He places a measuring stick from the top of the tank, through the center of the cylinder and down to the bottom. He pulls the measuring stick out and finds that the height of the fuel is 6 inches. What fraction of a full tank is left?

This question does not depend on the length of the cylinder, so we can reduce the problem to finding the fraction of area filled in a circle! In the circle below, the shaded region represents the part of the tank that is filled with fuel. Determine the length of x, y, r and the angle θ (in radians), report your answers as decimals rounded to the nearest tenth.



$x =$

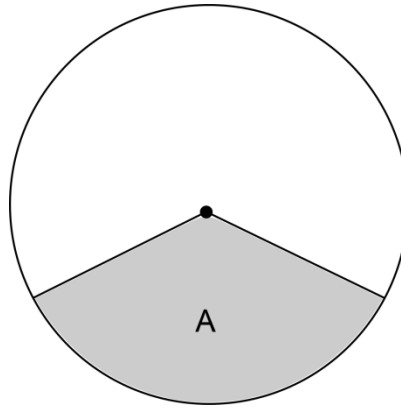
$y =$

$r =$

$\theta =$

Next, we let's find the area **A** of the circular sector that is shaded below. Remember that the area of this sector is given by the following equation:

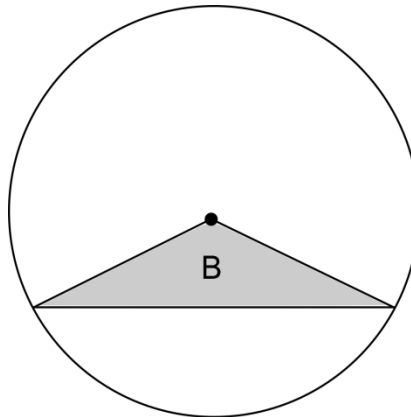
$$A = \left(\frac{\theta}{2\pi \text{ radians}} \right) \cdot \pi \cdot r^2$$



A=

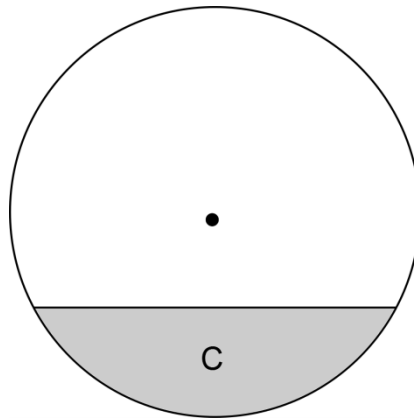
Now, let's find the area **B** of the triangle that is shaded below. The area of a right triangle is given by the equation:

$$B = \frac{x \cdot y}{2}$$



B=

Almost there! The area that the fuel fills **C** is shaded below; calculate it using the areas **A** and **B** that you previously found.



C =

Finally, divide the area **C** by the total area of the circle to determine the fraction of the tank that is full of fuel!

Answer: