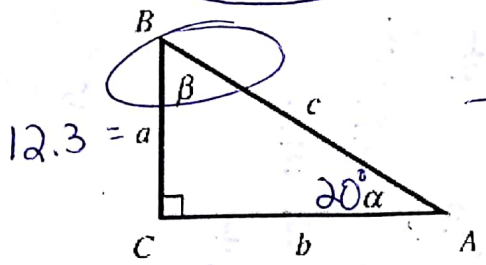
6)

solve the right $\Delta ABC$ for all of its unknown parts. $\alpha = 20°; a = 12.3$

$\beta = 70°$




$\tan 20° = \frac{12.3}{b}$

$\frac{b \cdot \tan 20}{\tan 20} = \frac{12.3}{\tan 20}$

$b = 33.794$

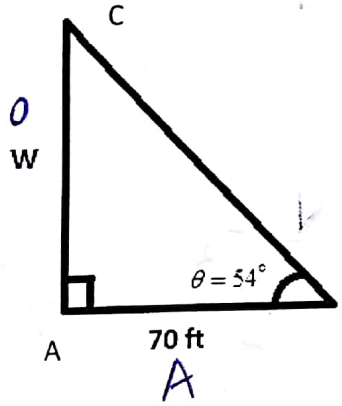
Degree mode!

$\sin 20 = \frac{12.3}{c}$

$\frac{c \sin 20}{\sin 20} = \frac{12.3}{\sin 20}$

$c = 35.963$

7) **A biologist wants to know the width W of a river in order to properly set instruments for studying the pollutants in the water. From point A, the biologist walks downstream 70 feet and sights to point C. From this sighting, it is determined that $\theta = 54°$. How wide is the river?**



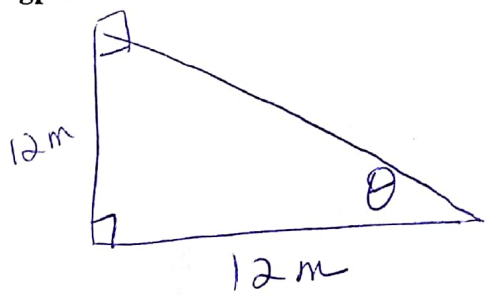

A

$\tan 54 = \frac{W}{70}$

$70 \cdot \tan 54 = W$

$W = 96.347$ ft

8) **A 12-meter flagpole casts a 12-meter shadow. Find $\theta$, the angle of elevation to the sun.**

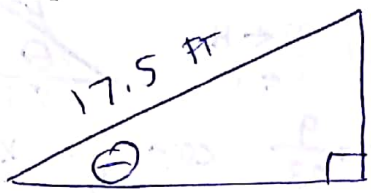



$\tan\theta = \frac{12}{12}$

$\theta = 45°$

$\theta = \tan^{-1}\left(\frac{12}{12}\right)$

9) **A ramp 17.5 feet in the length rises to a loading platform that is 3.5 feet off the ground. Find the angle $\theta$ that the ramp makes with the ground.**




$\sin\theta = \frac{3.5}{17.5}$

$\theta = \sin^{-1}\left(\frac{3.5}{17.5}\right) = 11.537^\circ$

Fill in the angles in degrees and radians on the blank unit circle. If $x = \cos\theta$ and $y = \sin\theta$, how can we use special right triangles to figure out the coordinate points on the circle?

6th

# The Unit Circle

$r = 1$

QI

QII

QIII

QIV

$(x, y)$

$\cos\theta$ ~~$\sin\theta$~~

$\tan\theta = \frac{y}{x}$