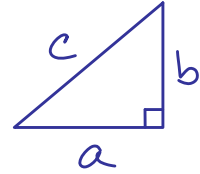


# Calculus C - Warmup - 7.3

Pythagorean Theorem:  $a^2 + b^2 = c^2$

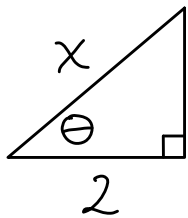


Given  $\sqrt{a^2 \pm u^2}$  set up a right triangle illustrating the pythagorean relationship and write  $x$  in terms of  $\theta$ . Hint: If  $x$  is not the hypotenuse, put it opposite  $\theta$ .

Don't forget: Soh Cah Toa

$\hookrightarrow \text{csc} = \text{ho} \hookrightarrow \text{sec} = \text{ha} \hookrightarrow \text{cot} = \text{ao}$

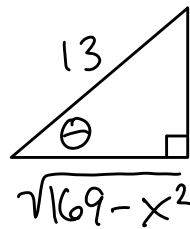
Example:  $\sqrt{x^2 - 4}$



$$\frac{x}{2} = \sec \theta$$

$$x = 2 \sec \theta$$

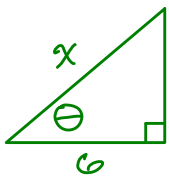
Example:  $\sqrt{169 - x^2}$



$$\frac{x}{13} = \sin \theta$$

$$x = 13 \sin \theta$$

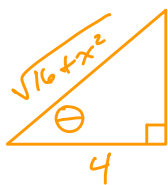
①  $\sqrt{x^2 - 36}$



$$\frac{x}{6} = \sec \theta$$

$$x = 6 \sec \theta$$

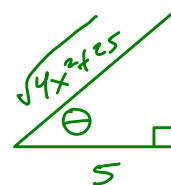
②  $\sqrt{16 + x^2}$



$$\frac{x}{4} = \tan \theta$$

$$x = 4 \tan \theta$$

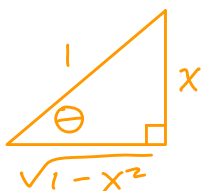
③  $\sqrt{4x^2 + 25}$



$$\frac{2x}{5} = \tan \theta$$

$$x = \frac{5}{2} \tan \theta$$

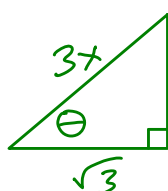
④  $\sqrt{1 - x^2}$



$$\frac{x}{1} = \sin \theta$$

$$x = \sin \theta$$

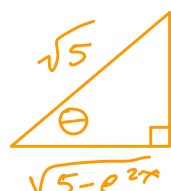
⑤  $\sqrt{9x^2 - 3}$



$$\frac{3x}{\sqrt{3}} = \sec \theta$$

$$x = \frac{\sqrt{3}}{3} \sec \theta$$

⑥  $\sqrt{5 - e^{2x}}$



$$\frac{e^x}{\sqrt{5}} = \sin \theta$$

$$e^x = \sqrt{5} \sin \theta$$

$$x = \ln(\sqrt{5} \sin \theta)$$