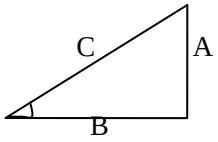
Trigonometry basis

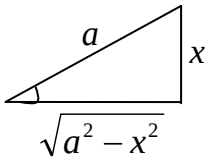
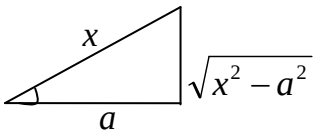
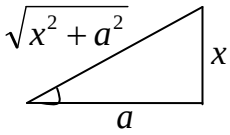


$A^2 + B^2 = C^2$

$\sin\theta = \frac{A}{C}, \quad \tan\theta = \frac{A}{B}, \quad \sec\theta = \frac{C}{B}, \quad (\theta$ is the indicated angle)

$\sin^2\theta + \cos^2\theta = 1, \quad \sec^2\theta = \tan^2\theta + 1. \quad \csc^2\theta = \cot^2\theta + 1.$

How to deal with these (assume $a > 0$)

$\sqrt{a^2 - x^2}$ 	$x = a\sin\theta, \quad (-\frac{\pi}{2} \le \theta \le \frac{\pi}{2})$ $dx = a\cos\theta d\theta$ $\sqrt{a^2 - x^2} = \sqrt{a^2(1 - \sin^2\theta)} = a\cos\theta$
$\sqrt{x^2 - a^2}$ 	$x = a\sec\theta, \quad (0 \le \theta < \frac{\pi}{2}$, or $\pi \le \theta < \frac{3\pi}{2})$ $dx = a\sec\theta\tan\theta d\theta$ $\sqrt{x^2 - a^2} = \sqrt{a^2(\sec^2\theta - 1)} = a\tan\theta$
$\sqrt{x^2 + a^2}$ 	$x = a\tan\theta, \quad (-\frac{\pi}{2} \le \theta \le \frac{\pi}{2})$ $dx = a\sec^2\theta d\theta$ $\sqrt{x^2 + a^2} = \sqrt{a^2(\tan^2\theta + 1)} = a\sec\theta$