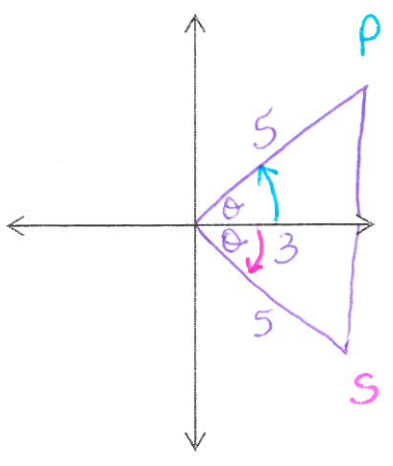


Section 4-4 Arcsine, Arctangent, Arccosine

* These examples are for positive ratios.

P = principal S = secondary

Sketch the angles in standard position illustrating the angle $\cos^{-1} \frac{3}{5}$



$$\arccos y = \pm \cos^{-1} y + 360n$$

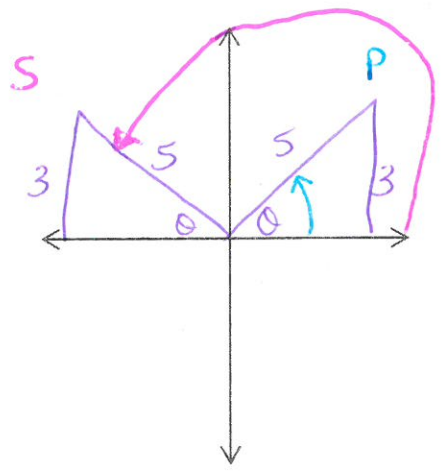
$$\arccos y = \pm \cos^{-1} y + 2\pi n$$

* Principal Solutions: $0^\circ \leq \theta \leq 180^\circ$
or $0 \leq x \leq \pi$

* Secondary Solutions: - (principal solution)

* Add 360 or 2π to Prime. + Sec. sol. to get other sol.

Sketch the angles in standard position illustrating the angle $\sin^{-1} \frac{3}{5}$



$$\arcsin x = \sin^{-1} y + 360n \text{ or } (180 - \sin^{-1} y) + 360n$$

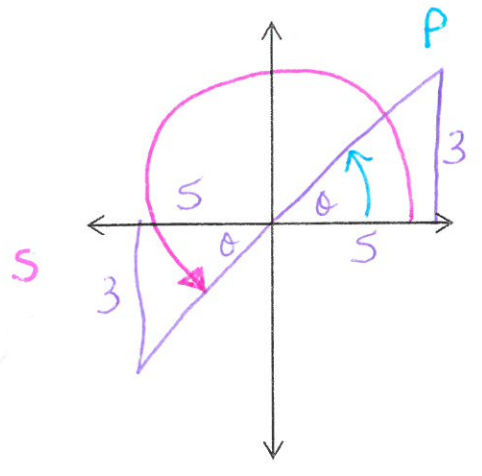
$$\arcsin x = \sin^{-1} y + 2\pi n \text{ or } (\pi - \sin^{-1} y) + 2\pi n$$

* Principal Solutions: $-90^\circ \leq \theta \leq 90^\circ$
or $-\frac{\pi}{2} \leq x \leq \frac{\pi}{2}$

* Secondary Solutions: $180^\circ -$ (principal sol.)

* Same as above $\pi -$ (principal sol.)

Sketch the angles in standard position illustrating the angle $\tan^{-1} \frac{3}{5}$



$$\arctan y = \tan^{-1} y + 180n$$

$$\arctan y = \tan^{-1} y + \pi n$$

* Principal Solutions: $-90^\circ < \theta < 90^\circ$
or $-\frac{\pi}{2} < x < \frac{\pi}{2}$

* Add 180 or π to Prime. Sol. to get other sol.

* Secondary Solutions: $180^\circ +$ (prime. sol.)
or $\pi +$ (prime. sol.)

Find the general solution for θ or x .

1a) $\theta = \arccos(0.6)$

$$\theta = \pm \cos^{-1} 0.6 + 360^\circ n$$

b) $x = \arccos(-0.5)$

$$x = \pm \cos^{-1}(-0.5) + 2\pi n$$

2a) $\theta = \arcsin(0.8)$

$$\theta = \sin^{-1}(0.8) + 360^\circ n$$

$$\theta = 180 - \sin^{-1}(0.8) + 360^\circ n$$

b) $x = \arcsin(0.4)$

$$x = \sin^{-1}(0.4) + 2\pi n$$

$$x = \pi - \sin^{-1}(0.4) + 2\pi n$$

3a) $\theta = \arctan(1.5)$

$$\theta = \tan^{-1}(1.5) + 180^\circ n$$

b) $x = \arctan(2)$

$$x = \tan^{-1}(2) + \pi n$$