

Solve for x.

1. $2\cos\theta + \sqrt{3} = 0$ $\theta = [0, 360]$

$$\frac{2\cos\theta}{2} = \frac{-\sqrt{3}}{2}$$

$$\cos\theta = -\frac{\sqrt{3}}{2}$$

$$\theta = \boxed{150^\circ, 210^\circ}$$

2. $4\cos^2\theta = 3$ $\theta = [0, 360]$

$$\sqrt{\cos^2\theta} = \pm\sqrt{\frac{3}{4}}$$

$$\cos\theta = \pm\frac{\sqrt{3}}{2}$$

$$\boxed{30^\circ, 150^\circ, 210^\circ, 330^\circ}$$

3. $\sin^2 x - 2\sin x = 3$ $x = [0, 360]$

$$x^2 - 2x = 3$$

$$x^2 - 2x - 3 = 0$$

$$(x+1)(x-3) = 0$$

$$\begin{matrix} x+1=0 & x-3=0 \\ x=-1 & x=3 \end{matrix}$$

$$\sin x = -1 \quad \sin x = 3$$

$$\boxed{270^\circ}$$

4. $2\sin^2 x = 9\sin x + 5$ $x = [0, 360]$

$$-9\sin x - 5 \quad -9\sin x - 5$$

$$2\sin^2 x - 9\sin x - 5 = 0$$

$$2x^2 - 9x - 5 = 0$$

$$(2x-10)(2x+1) = 0$$

$$2x-10=0 \quad 2x+1=0$$

$$x=5 \quad x=-\frac{1}{2}$$

$$\boxed{210^\circ, 330^\circ}$$

5. $\sin^2 B - \sin B = 0$ $B = [-90, 90]$

$$\sin B(\sin B - 1) = 0$$

$$\sin B = 0 \quad \sin B - 1 = 0$$

$$\sin B = 1$$

$$\boxed{0^\circ, 180^\circ} \quad \boxed{90^\circ}$$

6. $2\cos\theta + \sqrt{3} = 0$ $\theta = [0, 180]$

$$\frac{2\cos\theta}{2} = \frac{-\sqrt{3}}{2}$$

$$\cos\theta = -\frac{\sqrt{3}}{2}$$

$$\boxed{150^\circ}$$

7. $3\tan(\theta + 25) = \frac{3}{3}$ $\theta = [0, 360]$

$$\tan(\theta + 25) = 1$$

$$\theta + 25 = 45^\circ \quad \theta + 25 = 225^\circ$$

$$\theta = 20^\circ \quad \theta = 200^\circ$$

$$\boxed{\theta = 20^\circ} \quad \boxed{\theta = 200^\circ}$$

8. $\sin\theta\cos\theta = 0$ $\theta = [0, 180]$

$$\boxed{0^\circ, 90^\circ, 180^\circ}$$

9. $3\sin x + 1 = \sin x$ $x = [0, 180]$

$$-5\sin x \quad -\sin x$$

$$3\sin x - \sin x + 1 = 0$$

$$2\sin x + 1 = 0$$

$$\frac{2\sin x}{2} = \frac{-1}{2}$$

$$\sin x = -\frac{1}{2}$$

$$\boxed{210^\circ, 330^\circ}$$

10. $2\sin(a)\cos(a) = \sin(a)$ $a = [0, 90]$

$$-5\sin a \quad -\sin a$$

$$2\sin a \cos a - \sin a = 0$$

$$\sin a(2\cos a - 1) = 0$$

$$\sin a = 0 \quad 2\cos a - 1 = 0$$

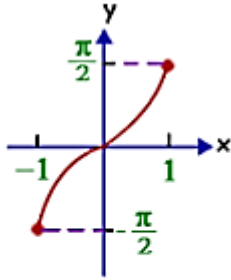
$$\cos a = \frac{1}{2}$$

$$\boxed{0^\circ} \quad \boxed{60^\circ}$$

Inverse Trig Functions. We have to restrict the range to have a function and not a relation.

$$f(x) = \sin^{-1} x$$

Values of x used in arcsine are in quadrat I and IV.

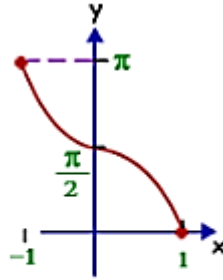


Domain : $-1 \leq x \leq 1$

Range : $-\frac{\pi}{2} \leq y \leq \frac{\pi}{2}$

$$f(x) = \cos^{-1} x$$

Values of x used in arccosine are in quadrat I and II.

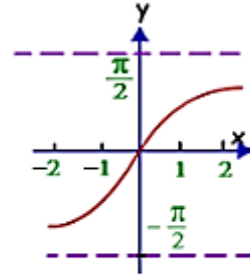


Domain : $-1 \leq x \leq 1$

Range : $0 \leq y \leq \pi$

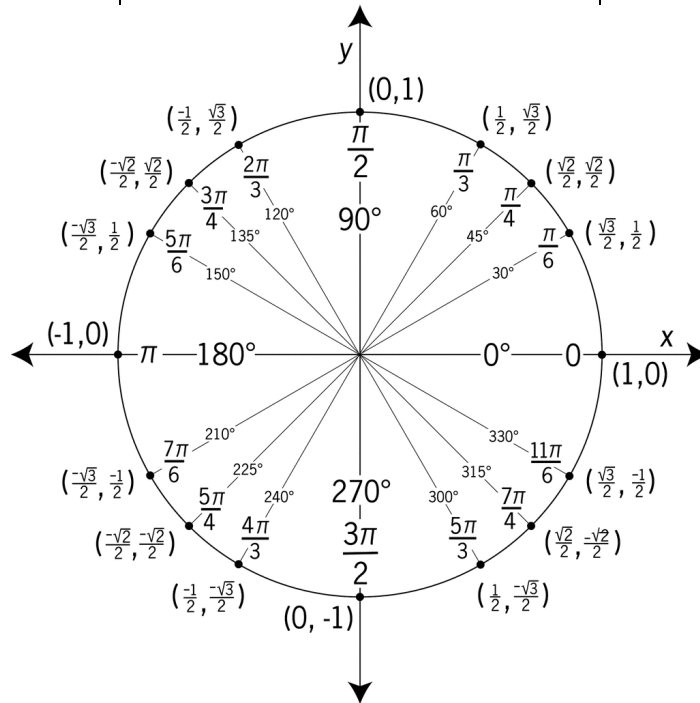
$$f(x) = \tan^{-1} x$$

Values of x used in arctangent are in quadrat I and IV.



Domain : $-\infty < x < \infty$

Range : $-\frac{\pi}{2} < y < \frac{\pi}{2}$



Simplify the following.

1. $\sin^{-1}(-1)$ 270°

2. $\cos^{-1}\left(\frac{1}{2}\right)$ 60°

3. $\cos^{-1}(0)$ 90°

4. $\cos^{-1}(3)$ undefined

5. $\sin^{-1}\left(-\frac{1}{2}\right)$ 330°

6. $\cos^{-1}\left(-\frac{\sqrt{2}}{2}\right)$ 135°

7. $\sin\left(\cos^{-1}\left(-\frac{\sqrt{3}}{2}\right)\right)$ $\frac{1}{2}$

8. $\cot^{-1}\left(-\frac{\sqrt{3}}{3}\right)$ 300°

9. $\tan\left(\sin^{-1}\left(\frac{\sqrt{2}}{2}\right)\right)$ -1

10. $\csc^{-1}(\cos(\pi))$ 90°

11. $\sin^{-1}\left(\sin\left(\frac{4\pi}{3}\right)\right)$ 300°

12. $\sin\left(\cos^{-1}\left(\frac{1}{2}\right)\right)$ $\frac{\sqrt{3}}{2}$

Precalculus Solving Trig Equations Review 2

Name: _____ Block: ____

Find all the solutions for $0 \leq x \leq 360$

1. $3 \sec^2 x - 4 = 0$

2. $4 \cos^2 x - 2 = 0$

3. $2 \sin^2 x + 5 \sin x = 3$

4. $\sin x - 2 \sin x \cos x = 0$

5. $10 \cos x - 4 = 4 \cos x$

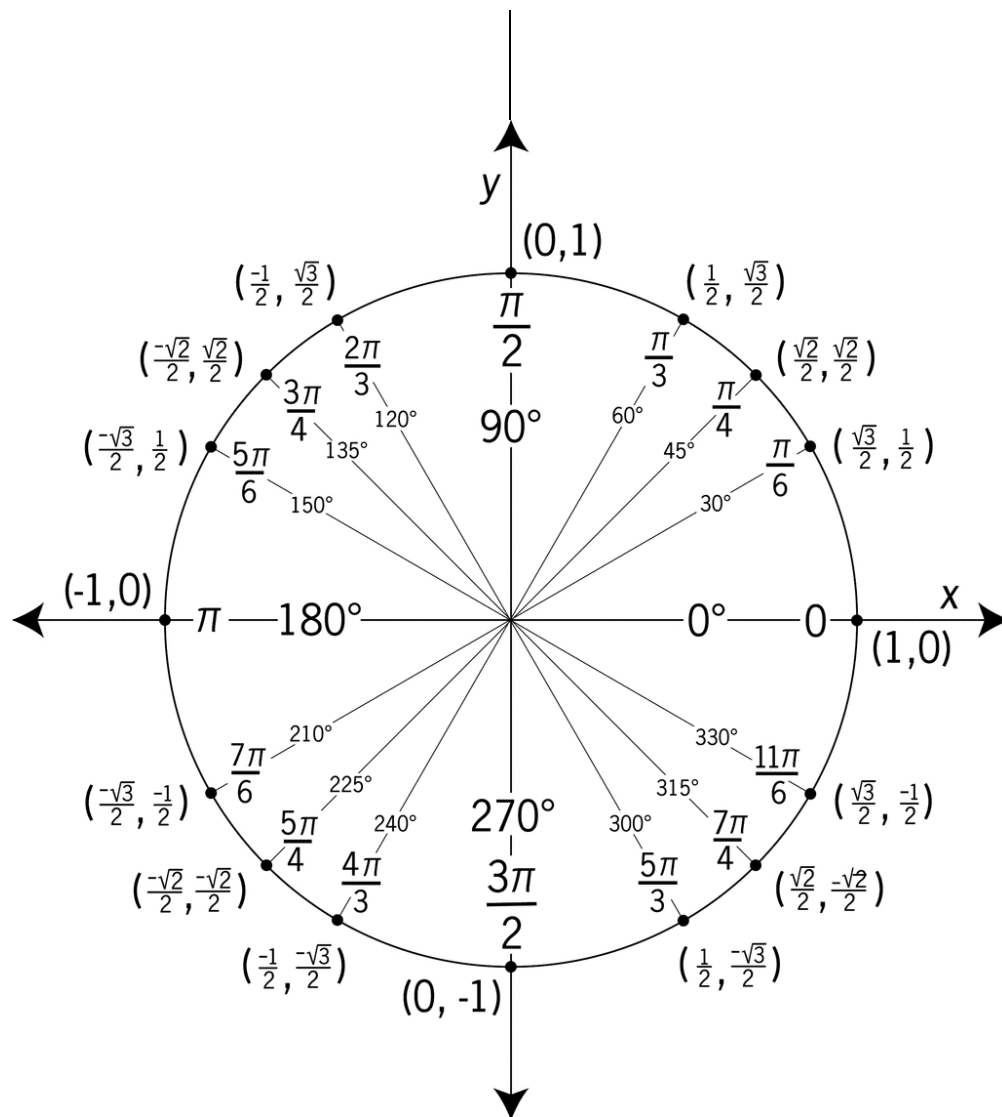
6. $\sin^2 x - 3 \sin x = -2$

7. $16 \tan^2 x = 5$

8. $2 \cos^2 x + \cos x = 0$

9. $3 \sin x = 2 \cos^2 x$

10. $\sqrt{3} \tan x + 1 = 0$



Find the exact value of the expression.

1. $\arcsin\left(\frac{1}{2}\right)$

2. $\cos\left(\sin^{-1}\left(\frac{1}{2}\right)\right)$

3. $\cos^{-1}\left(\frac{\sqrt{3}}{2}\right)$

4. $\sin^{-1}\left(\frac{\sqrt{3}}{2}\right)$

5. $\arctan(-\sqrt{3})$

6. $\sin\left(\operatorname{arcsec}\left(\frac{2\sqrt{3}}{3}\right)\right)$

7. $\csc(20^\circ)$

8. $\operatorname{arcsec}(2)$

9. $\cot\left(\frac{9}{2}\right)$

10. $\csc(\arctan(1))$

11. $\tan^{-1} 1$

12. $\cot^{-1}(-1)$