

# TRIGONOMETRY

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**Question 1. Which of the expressions is equivalent to:**

$$\frac{\cos(\theta)}{1 - \sin(\theta)} - \tan(\theta)$$

- A.  $\sec(\theta)$       B.  $\sin(\theta)$       C.  $\cos(\theta)$       D.  $2 \csc(\theta)$

**Question 2. Prove the following identities:**

$$\frac{\csc(\theta)}{\sin(\theta)} = \csc^2(\theta)$$

$$\frac{\sin^2(\theta)}{1 - \sin^2(\theta)} = \tan^2(\theta)$$

**Question 3. Express each of the following in terms of sine and cosine:**

a)  $\tan(x) \cdot \sec^2(x)$

b)  $\frac{\cot(x)}{\csc(x)}$

**Question 4. Select one or more expressions that together represent all solutions to the equation. The answer will be in radians.**

Hint:  $\arccos\left(\frac{1}{10}\right) \approx 1.47$

$$\cos(x) = -0.1$$

- $1.67 + k \cdot 2\pi$
- $1.47 + k \cdot \pi$
- $-1.47 + k \cdot \pi$
- $-1.67 + k \cdot 2\pi$
- $-1.67 + k \cdot \pi$

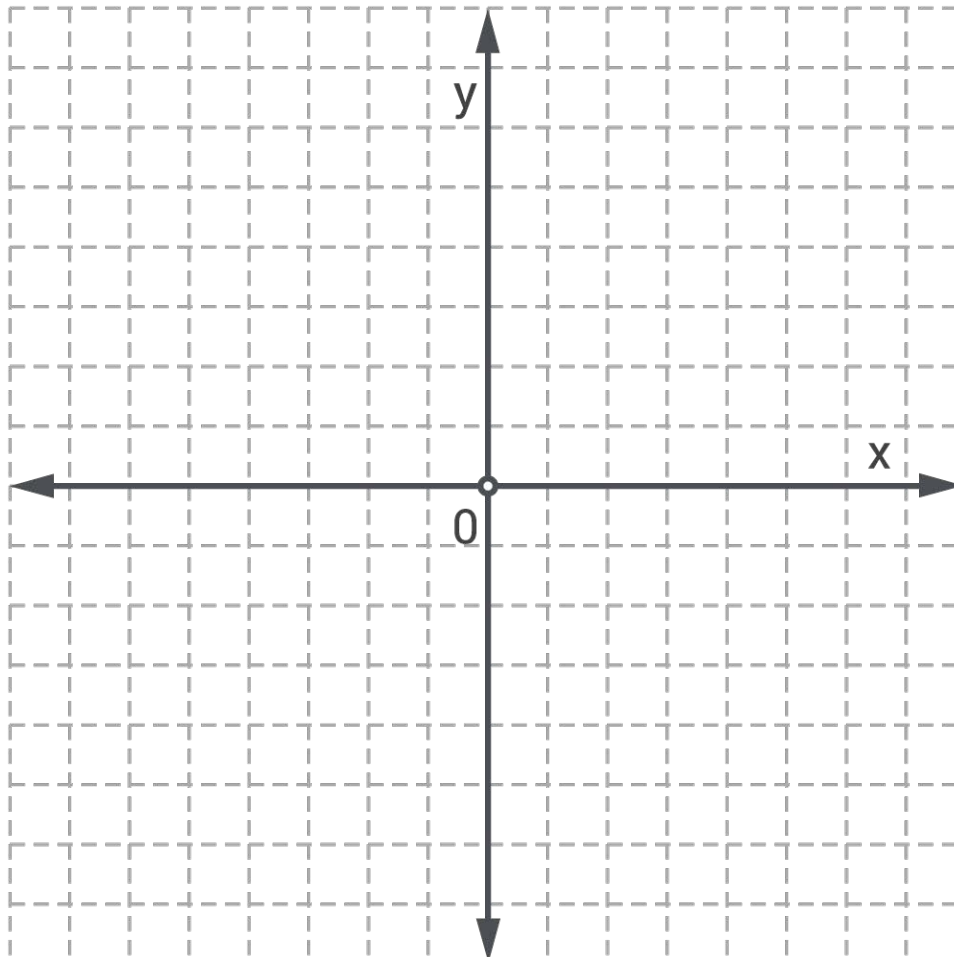
**Question 5. Identify the domain of the following function.**

Hint:  $\sin^{-1}(x) = \arcsin(2x)$

$$y = 2 \cdot \sin^{-1}(2x)$$

**Question 6. Sketch the graph for:**

$$\tan(4x) \quad \text{for} \quad 0 \leq x \leq 2\pi$$



**Question 7. Solve the following:**

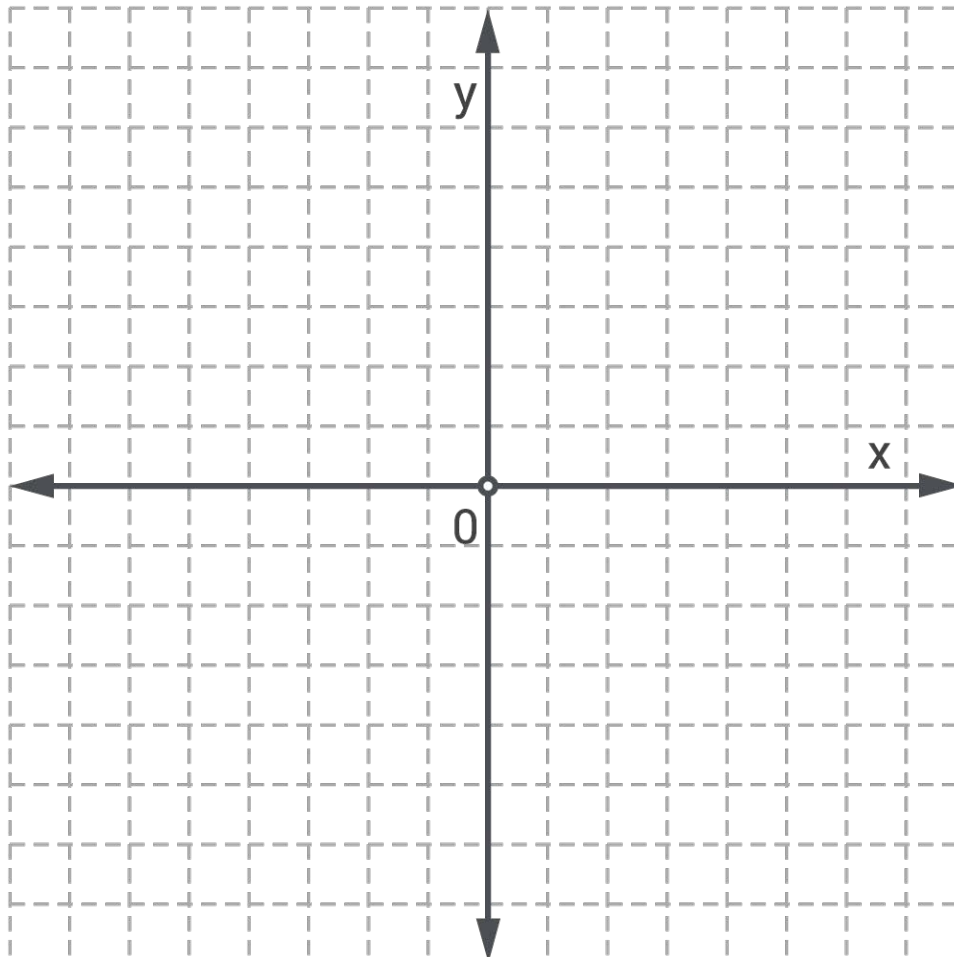
$$\sin^2(x) - 3 \sin(x) + 2 = 0$$

$$3 \cdot \cos(x + \pi) = 2$$

$$\sin(x) - \sqrt{3} \cos(x) = 0$$

**Question 8. Sketch the graph for:**

$$y = \sin^{-1}(2x)$$



**Question 9. Solve the following.**

$$\csc(90^\circ) =$$

$$\frac{\cot^2(x) - 1}{2 \cot(a)} =$$

$$\cos(100^\circ) \cos(40^\circ) + \sin(100^\circ) \sin(40^\circ)$$