

Lesson 20- Aim: How do we solve first and second-degree Trigonometric Equations?

Do Now: Solve for x or θ

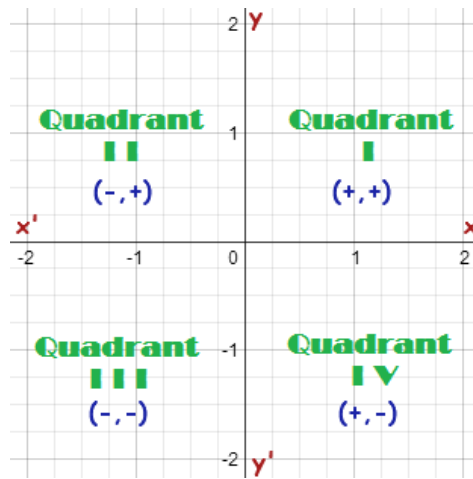
1) $2x - 1 = 0$

2) $2 \sin \theta - 1 = 0$

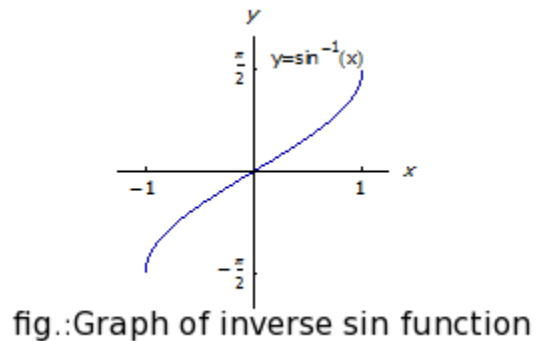
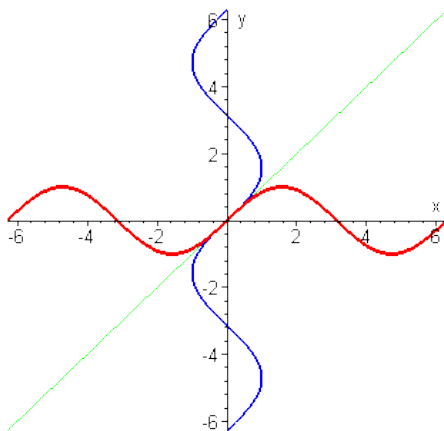
I – First Degree Trigonometric Equations

- 1) The variables are expressed as trigonometric functions
- 2) The solution is expressed as the measure of an angle in either degrees or radians
- 3) Let's return to the Do Now problem

What's the angle measure? In degrees and/or radians

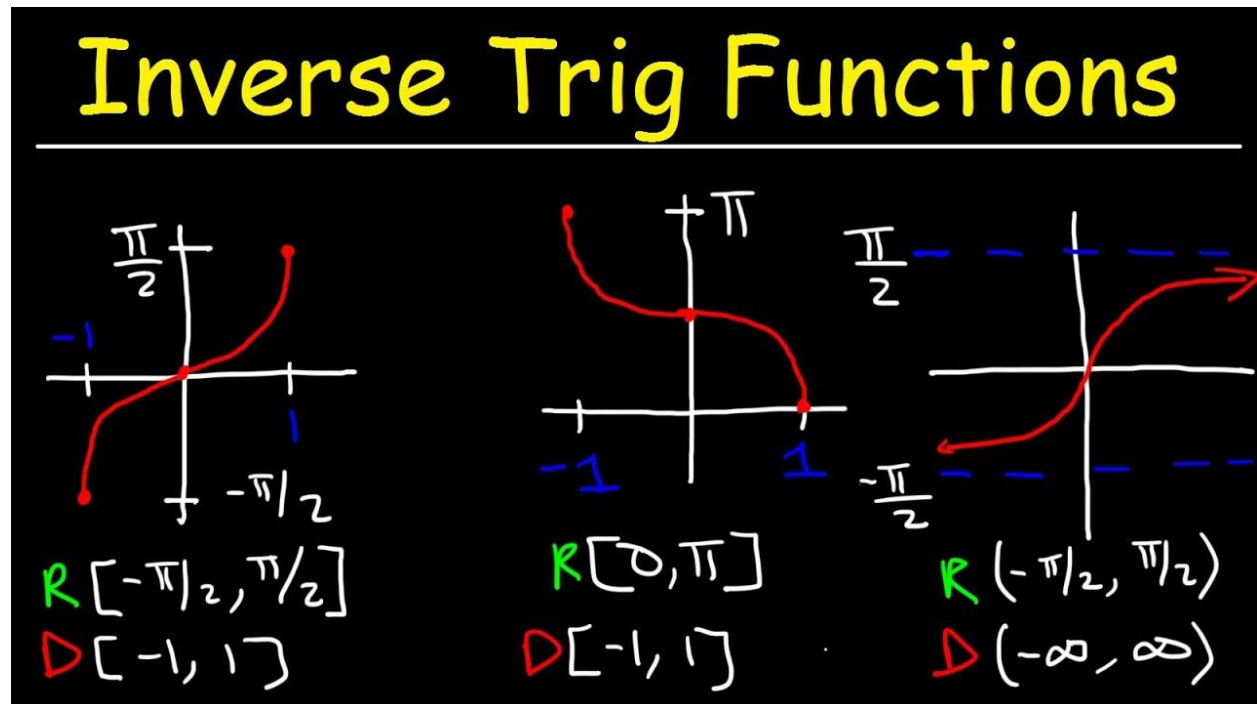


- 4) What is the domain of the inverse of the sine function?



- 5) Inverse of other functions (match the correct graph with its corresponding inverse below)

Language Objective: Teacher will ask members of the groups for a short explanation as to their understanding of the inverse functions and their corresponding domain/range restrains



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

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

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

6) Exercises

Find the angle (s) in the interval $[0, 360]$

a) $3 \tan \theta - 5 = 7$

b) $3 \sin \theta - 5 = 7$

II – Second Degree Trigonometric Equations

Language Objective: Teacher will ask members of the groups for a short explanation as to their understanding of the inverse functions and their corresponding domain/range restrains

Lesson 20- Aim: How do we solve first and second-degree Trigonometric Equations?

1) Compare $x^2 - 3x - 4 = 0$ and $\tan^2 \theta - 3 \tan \theta - 4 = 0$

Use any method: factoring or the quadratic formula

III – Exercising

First Degree

Writing About Mathematics

1. Explain why the solution set of the equation $2x + 4 = 8$ is $\{2\}$ but the solution set of the equation $2 \sin x + 4 = 8$ is $\{ \}$, the empty set.
2. Explain why $2x + 4 = 8$ has only one solution in the set of real numbers but the equation $2 \tan x + 4 = 8$ has infinitely many solutions in the set of real numbers.

Developing Skills

In 3–8, find the exact solution set of each equation if $0^\circ \leq \theta < 360^\circ$.

3. $2 \cos \theta - 1 = 0$

4. $3 \tan \theta + \sqrt{3} = 0$

Second Degree

Writing About Mathematics

1. Can the equation $\tan \theta + \sin \theta \tan \theta = 1$ be solved by factoring the left side of the equation? Explain why or why not.
2. Can the equation $2(\sin \theta)(\cos \theta) + \sin \theta + 2 \cos \theta + 1 = 0$ be solved by factoring the left side of the equation? Explain why or why not.

Developing Skills

In 3–8, find the exact solution set of each equation if $0^\circ \leq \theta < 360^\circ$.

3. $2 \sin^2 \theta + \sin \theta - 1 = 0$

4. $3 \tan^2 \theta = 1$

5. $\tan^2 \theta - 3 = 0$

6. $2 \sin^2 \theta - 1 = 0$

Language Objective: Teacher will ask members of the groups for a short explanation as to their understanding of the inverse functions and their corresponding domain/range restrains