

Trigonometric Equations

(covers parts of Sullivan 7.3, 7.5, and 7.6)

Ex 1.

Find all solutions of the given equation.

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

Ex 2.

Find all solutions of the given equation.

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

Ex 3.

Find all solutions of the given equation in the interval $[0, 4\pi)$.

$$2 \cos^2 \theta - 7 \cos \theta + 3 = 0$$

Ex 4.

Find all solutions of the given equation.

$$5 \sin \theta \cos \theta + 4 \cos \theta = 0$$

Ex 5.

Find all solutions of the given equation.

$$1 + \sin \theta = 2 \cos^2 \theta$$

Ex 6.

Find all solutions of the given equation in the interval $[0, 2\pi)$.

$$\cos \theta + 1 = \sin \theta$$

Ex 7.

Find all solutions of the given equation in the interval $[0, 2\pi)$.

$$2 \sin 3\theta + \sqrt{3} = 0$$

Some things to try when solving trig equations:

- Move all terms to one side and factor
- Use trig identities to rewrite parts of the equation (ex: $\sin 2\theta = 2 \sin \theta \cos \theta$)
- Rewrite all trig functions to be in terms of a single trig function
- Square both sides (this sometimes allows you to use $\sin^2 \theta + \cos^2 \theta = 1$, etc.)