

Name _____

Date _____

Advanced Algebra

Chapter 10- Trigonometry

Solving Trig Equations #12

Solve each equation for the principal value of θ . θ values should be given in degrees.

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

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

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

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

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

$$\theta = 60^\circ$$

3) $\sqrt{2} \sin \theta - 1 = 0$

$$\sin \theta = \frac{1}{\sqrt{2}}$$

$$\sin \theta = \frac{\sqrt{2}}{2}$$

$$\theta = 45^\circ$$

4) $2 \cos \theta + 1 = 0$

$$\cos \theta = -\frac{1}{2}$$

$$\boxed{\theta = 240^\circ}$$

5) $2 \cos \theta - \sqrt{3} = 0$

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

$$\boxed{\theta = 30^\circ}$$

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

$$\sin 2\theta = 1$$

$$\boxed{\theta = 45}$$

7) $\cos(3\theta) - .5 = 0$

$$\cos 3\theta = \frac{1}{2}$$

$$\boxed{\theta = 20}$$

8) $\tan(2\theta) - \sqrt{3} = 0$

$$\tan(2\theta) = \sqrt{3}$$

$$2\theta = 60$$

$$\theta = 30^\circ$$

$$9) \cos(2\theta) = \cos \theta$$

$$10) \sin \theta = \tan \theta$$

$$11) \sin \theta + \sin \theta \cos \theta = 0$$

$$\sin \theta (1 + \cos \theta) = 0$$

$$\begin{array}{l} \swarrow \quad \searrow \\ \sin \theta = 0 \quad \cos \theta = -1 \end{array}$$

$0, 360$	180°
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$$12) \sin \theta = \cos \theta$$

$$\star \star 13) \cos(2\theta) + \cos \theta + 1 = 0 \star$$

Double angle substitution

$$2\cos^2 \theta - 1 + \cos \theta + 1 = 0$$

$$2\cos^2 \theta + \cos \theta = 0$$

$$\cos \theta (2\cos \theta + 1) = 0$$

$$\begin{array}{l} \swarrow \quad \searrow \\ \cos \theta = 0 \quad \cos \theta = -\frac{1}{2} \end{array}$$

$\theta = 0^\circ$

$\theta = 120^\circ$ 240°

$$14) \tan^2 \theta - \sqrt{3} \tan \theta = 0$$