

Solve each trigonometric equation for θ on the interval $[0, 2\pi]$. Then give a formula for all possible angles that could be a solution of the equation.

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

$45^\circ, \frac{\pi}{4}$ $135^\circ, \frac{3\pi}{4}$
 $45^\circ \pm 360K$ $135^\circ \pm 360K$
 $\frac{\pi}{4} \pm 2\pi K$ $\frac{3\pi}{4} \pm 2\pi K$

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

$120^\circ, \frac{2\pi}{3}$ $240^\circ, \frac{4\pi}{3}$
 $120^\circ \pm 360K$ $240^\circ \pm 360K$
 $\frac{2\pi}{3} \pm 2\pi K$ $\frac{4\pi}{3} \pm 2\pi K$

C) $\sin \theta = 1$

90° $\frac{\pi}{2}$
 $90^\circ \pm 360K$
 $\frac{\pi}{2} \pm 2\pi K$

D) $\cos \theta = 0$

$90^\circ, \frac{\pi}{2}$ $270^\circ, \frac{3\pi}{2}$
 $90^\circ \pm 360K$ $270^\circ \pm 360K$
 $\frac{\pi}{2} \pm 2\pi K$ $\frac{3\pi}{2} \pm 2\pi K$

E) $\tan \theta = \sqrt{3}$

60° 240°
 $60^\circ \pm 360K$
 $240^\circ \pm 360K$
 $\frac{\pi}{3} \pm 2\pi K$
 $\frac{4\pi}{3} \pm 2\pi K$

$60^\circ \pm 180K$
 $\frac{\pi}{3} \pm \pi K$

F) $\tan \theta = -1$

$135^\circ \pm 180K$ $\frac{3\pi}{4} \pm \pi K$

~~$$\cos \alpha = \frac{1}{2}$$

$$\alpha = 60^\circ, 300^\circ$$~~

Solve each trigonometric equation for θ on the interval $[0, 2\pi]$.

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

$$2\theta = 60 \pm 360k$$

$$\theta = 30 \pm 180k$$

$$2\theta = 300 \pm 360k$$

$$\theta = 150 \pm 180k$$

30, 210, 150, 330

B) $\sin 3\theta = \frac{1}{2}$

$$3\theta = 30^\circ \pm 360k$$

$$\theta = 10 \pm 120k$$

$$3\theta = 150 \pm 360k$$

$$\theta = 50 \pm 120k$$

10, 130, 250 50, 170, 290

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

$$\frac{\theta}{3} = 30 \pm 360k$$

$$\theta = 90 \pm 1080k$$

$\boxed{90^\circ}$

D) $\tan\left(\frac{\theta}{2} + \frac{\pi}{3}\right) = 1$

$$\tan\left(\frac{\theta}{2} + 60^\circ\right) = 1$$

$$\frac{\theta}{2} + 60 = 45^\circ$$

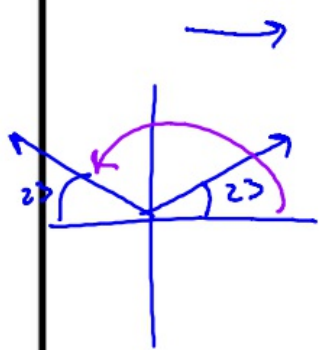
$$\frac{\theta}{2} = -15$$

$$\theta = -30^\circ$$

$$\frac{\theta}{2} + 60 = 225^\circ$$

$$\frac{\theta}{2} = 165^\circ$$

$$\theta = 330^\circ$$



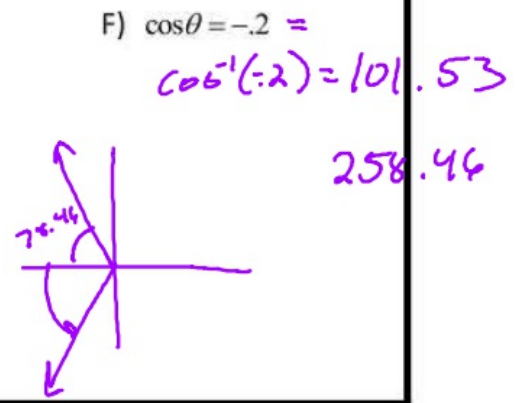
E) $\sin \theta = .4$

$$\sin^{-1}(.4) = \theta$$

$$\theta = 23.57^\circ$$

$$\theta = 156.42$$

\uparrow
 $180 - 23.57$



$$\sqrt{2}x - 1 = 0$$

$$\frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{\sqrt{2}}$$
$$\frac{\sqrt{2}}{\sqrt{4}} = \frac{\sqrt{2}}{2}$$

$$4x^2 - 1 = 0$$

$$\text{A) } \sqrt{2} \cos \theta - 1 = 0$$

$$\sqrt{2} \cos \theta = 1$$
$$\cos \theta = \frac{1}{\sqrt{2}}$$
$$\cos \theta = \frac{\sqrt{2}}{2}$$
$$45^\circ, 315^\circ$$

$$\text{C) } 4 \sin^2 \theta - 1 = 0$$

$$4 \sin^2 \theta = 1$$
$$\sqrt{\sin^2 \theta} = \sqrt{\frac{1}{4}}$$
$$\sin \theta = \pm \frac{1}{2}$$

$$\text{E) } 3 \tan^2 \theta - 1 = 0$$

$$\text{B) } \sqrt{5} \csc \theta - 2 = 0$$

$$2 \sin \theta + \sqrt{3} = 0$$
$$2 \sin \theta = -\sqrt{3}$$
$$\sin \theta = -\frac{\sqrt{3}}{2}$$
$$240^\circ, 300^\circ$$

$$\text{D) } (3 \tan^2 \theta - 1)(\tan^2 \theta - 3) = 0$$

$$\text{F) } \cos^2 \theta = 3 \sin^2 \theta$$