

Graphs & Inverses of Trig Functions

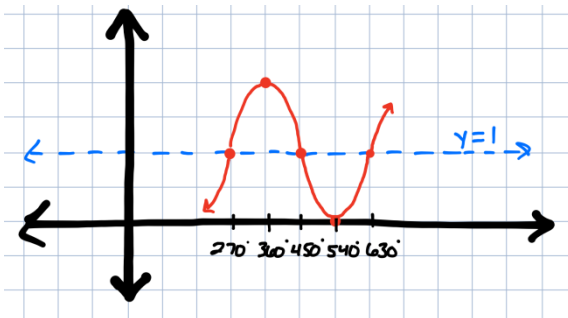
2A – Graphing Sine & Cosine

Write an equation of the sine function with the given information

- #1) amplitude = 5, period = 360°, phase shift = 60°, VD = 2

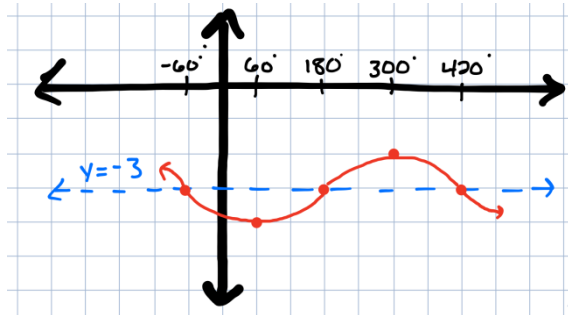
$$y = \pm 5 \sin(\theta - 60^\circ) + 2$$

#2)



$$y = \sin(\theta - 270^\circ) + 1$$

#3)



$$y = -\sin\left[\frac{3}{4}(\theta + 60^\circ)\right] - 3$$

$$480^\circ k = 360^\circ$$

$$k = \frac{360}{480}$$

$$k = \frac{36}{48}$$

$$k = \frac{3}{4}$$

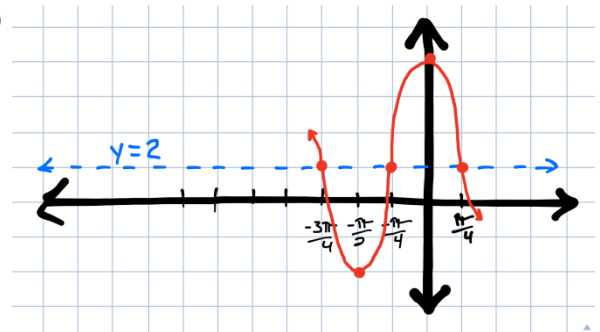
- #4) amplitude = 17, period = $\frac{\pi}{4}$, phase shift = $-\frac{\pi}{3}$, VD = -2

$$y = \pm 17 \sin\left[8\left(\theta + \frac{\pi}{3}\right)\right] - 2$$

$$2\pi k = \frac{\pi}{4}$$

$$k = 8$$

#5)

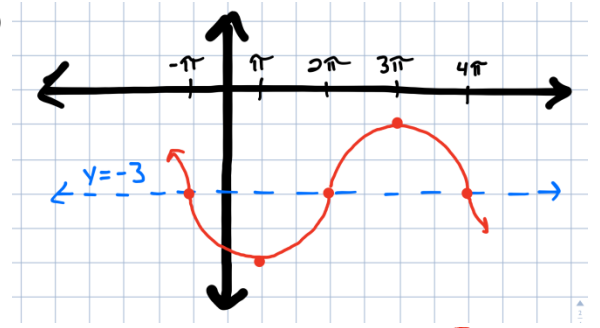


$$y = -6 \sin\left[2\left(\theta + \frac{3\pi}{4}\right)\right] + 2$$

$$2\pi k = 2\pi$$

$$k = 2$$

#6)



$$y = -2 \sin\left[\frac{2}{3}(\theta + \pi)\right] - 3$$

$$5\pi k = 2\pi$$

$$k = \frac{2}{5}$$

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2A – Graphing Sine & Cosine

Write an equation of the **cosine** function with the given information

- #7) amplitude = 3, period = 270° ,
phase shift = 120° , VD = 0

$$y = \pm 3 \cos\left[\frac{4}{3}(\theta - 170^\circ)\right]$$

$$270^\circ k = 360^\circ$$

$$k = \frac{36}{27}$$

$$k = \frac{4}{3}$$

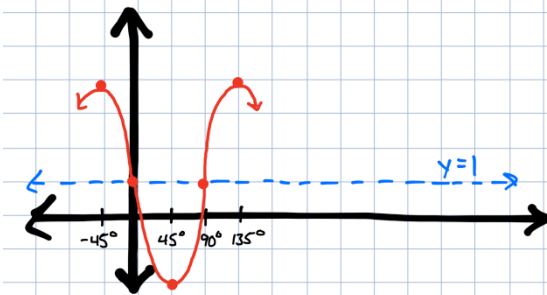
- #10) amplitude = $\frac{1}{3}$, period = π ,
phase shift = $\frac{\pi}{5}$, VD = 7

$$y = \pm \frac{1}{3} \cos\left[2\left(\theta - \frac{\pi}{5}\right)\right] + 7$$

$$\pi k = 2\pi$$

$$k = 2$$

#8)

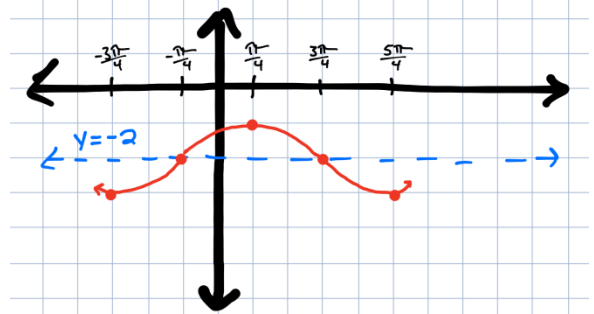


$$y = 3 \cos[2(\theta + 45^\circ)] + 1$$

$$180^\circ k = 360^\circ$$

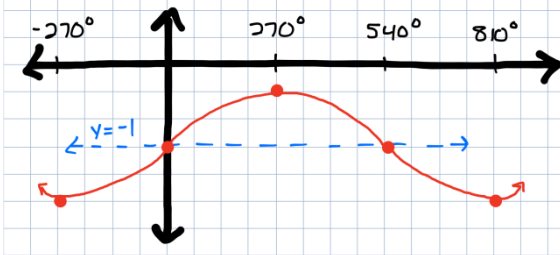
$$k = 2$$

#11)



$$y = -\cos\left(\theta + \frac{3\pi}{4}\right) - 2$$

#9)

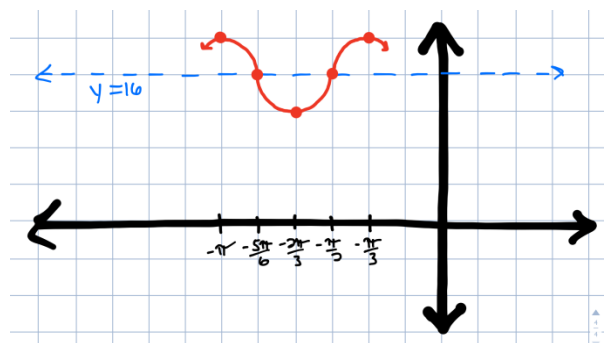


$$y = -\frac{2}{3} \cos\left[\frac{1}{3}(\theta - 270^\circ)\right] - 1$$

$$1080^\circ k = 360^\circ$$

$$k = \frac{1}{3}$$

#12)



$$y = 4 \cos[3(\theta + \pi)] + 16$$

$$\frac{2\pi}{3} k = 2\pi$$

$$k = 2\pi \cdot \frac{3}{2\pi}$$

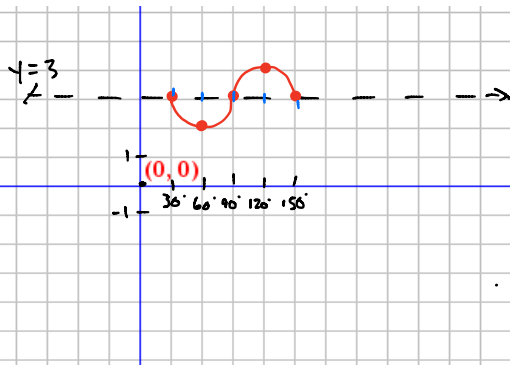
$$k = 3$$

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2A – Graphing Sine & Cosine

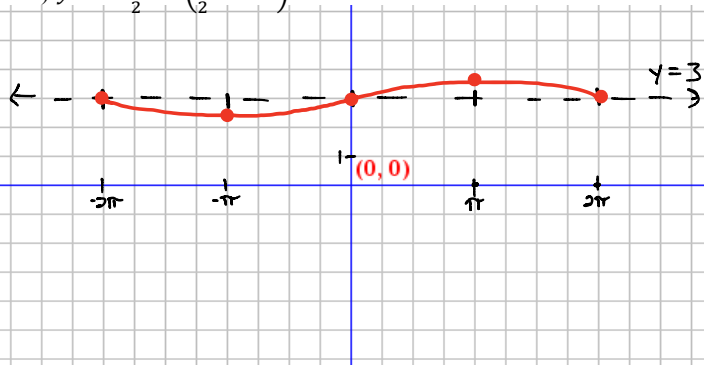
Graph each function for at least one period.

#13) $y = -\sin[3(\theta - 30^\circ)] + 3$



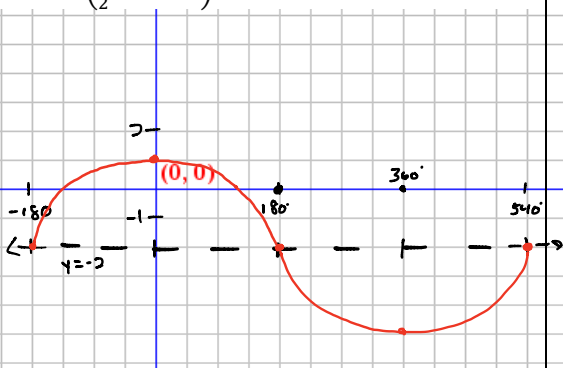
A: -1
 Amplitude: $|-1| = 1$
 Reflected over midline? *yes*
 Vertical Displacement: 3
 Midline: $y = 3$
 Phase Shift: 30°
 Period: $\frac{360^\circ}{3} = 120^\circ$

#15) $y = -\frac{1}{2}\sin\left[\frac{1}{2}(\theta + 2\pi)\right] + 3$



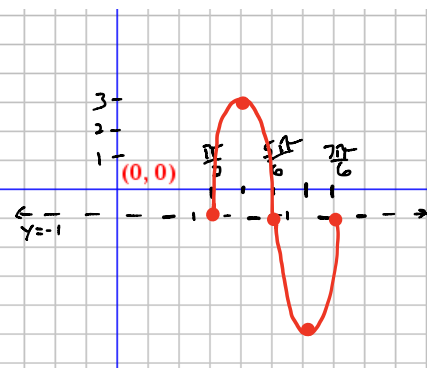
A: $-\frac{1}{2}$
 Amplitude: $|\frac{1}{2}| = \frac{1}{2}$
 Reflected over midline? *yes*
 Vertical Displacement: 3
 Midline: $y = 3$
 Phase Shift: -2π
 Period: $\frac{2\pi}{\frac{1}{2}} = 4\pi$

#14) $y = 3\sin\left[\frac{1}{2}(\theta + 180^\circ)\right] - 2$



A: 3
 Amplitude: $|3| = 3$
 Reflected over midline? *no*
 Vertical Displacement: -2
 Midline: $y = -2$
 Phase Shift: -180°
 Period: $\frac{360^\circ}{\frac{1}{2}} = 720^\circ$

#16) $y = 4\sin\left[3\left(\theta - \frac{\pi}{6}\right)\right] - 1$

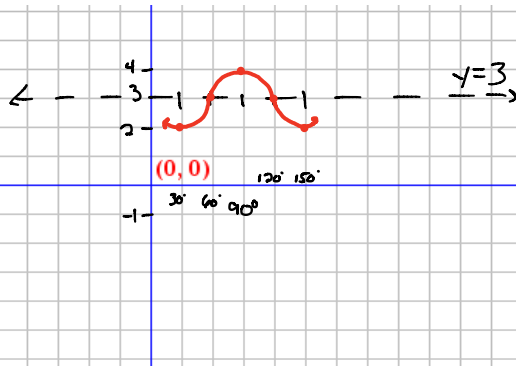


A: 4
 Amplitude: $|4|$
 Reflected over midline? *no*
 Vertical Displacement: -1
 Midline: $y = -1$
 Phase Shift: $\frac{\pi}{6}$
 Period: $\frac{2\pi}{3}$

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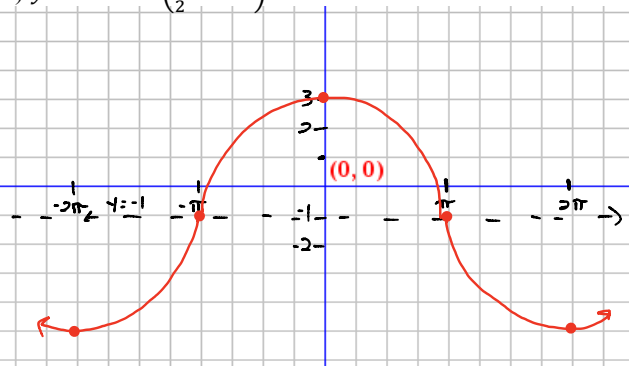
2A - Graphing Sine & Cosine

#17) $y = -\cos(3\theta - 90^\circ) + 3$



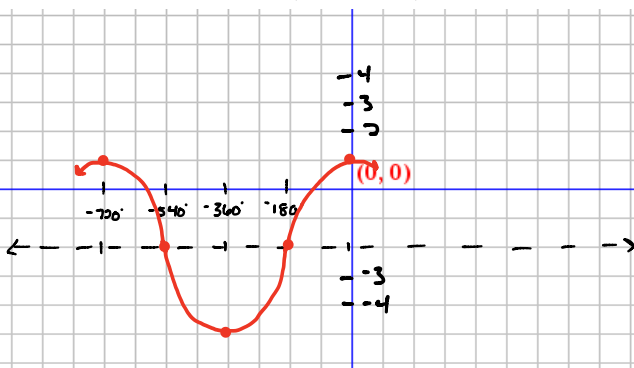
A: -1
 Amplitude: $|-1| = 1$
 Reflected over midline? **YES**
 Vertical Displacement: 3
 Midline: $y = 3$
 Phase Shift: 30°
 Period: $\frac{360^\circ}{3} = 120^\circ$

#19) $y = -4\cos\left[\frac{1}{2}(\theta + 2\pi)\right] - 1$



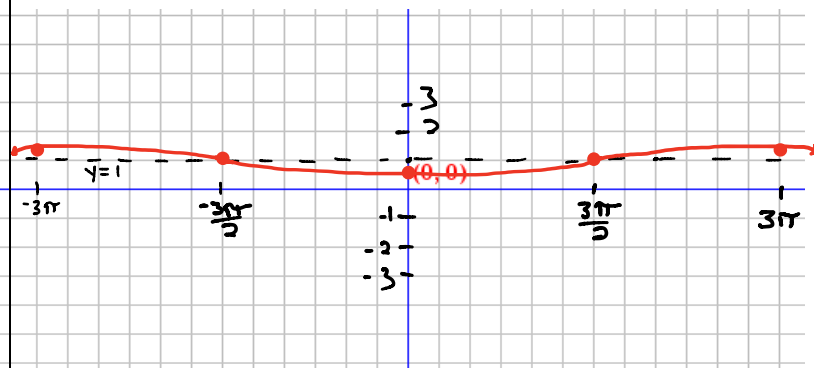
A: -4
 Amplitude: $|-4| = 4$
 Reflected over midline? **YES**
 Vertical Displacement: -1
 Midline: $y = -1$
 Phase Shift: -2π
 Period: $\frac{2\pi}{\frac{1}{2}} = 4\pi$

#18) $y = 3\cos\left[\frac{1}{2}(\theta + 720^\circ)\right] - 2$



A: 3
 Amplitude: $|3| = 3$
 Reflected over midline? $y = -2$
 Vertical Displacement: -2
 Midline: $y = -2$
 Phase Shift: -720°
 Period: $\frac{360^\circ}{\frac{1}{2}} = 720^\circ$

#20) $y = \frac{1}{3}\cos\left[\frac{1}{3}(\theta + 3\pi)\right] + 1$



A: $\frac{1}{3}$
 Amplitude: $|\frac{1}{3}| = \frac{1}{3}$
 Reflected over midline? **NO**
 Vertical Displacement: 1
 Midline: $y = 1$
 Phase Shift: -3π
 Period: $\frac{3\pi}{\frac{1}{3}} = 6\pi$