

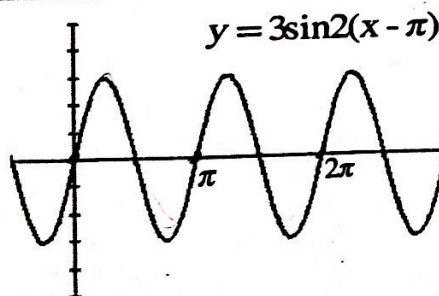
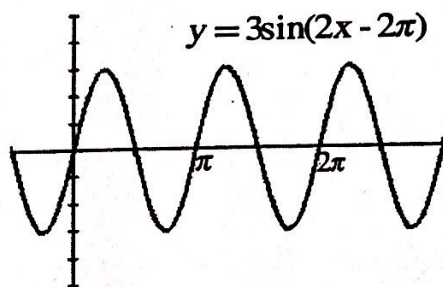
Writing Equations of Sine & Cosine Graphs

$$y = 3\sin\left(\frac{2x}{2} - \frac{2\pi}{2}\right)$$

$$y = 3\sin 2(x - \pi)$$

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Quiz Review

Writing Equations of Sine and Cosine Graphs

Determine:

- sine or cosine
- amplitude $|a|$
- vertical shift d
- period \longrightarrow
- phase shift

Use:

$$y = a \cdot \sin(bx - c) + d$$

or

$$y = a \cdot \cos(bx - c) + d$$

period: $\frac{2\pi}{b} \rightarrow b = \frac{2\pi}{\text{period}}$ or $\frac{360^\circ}{\text{period}}$

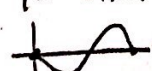
argument: $b(x - \text{phaseshift})$
($bx - c$)

$b(\theta - \text{phaseshift})$

$y = \sin x$



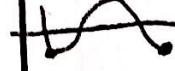
$y = -\sin x$



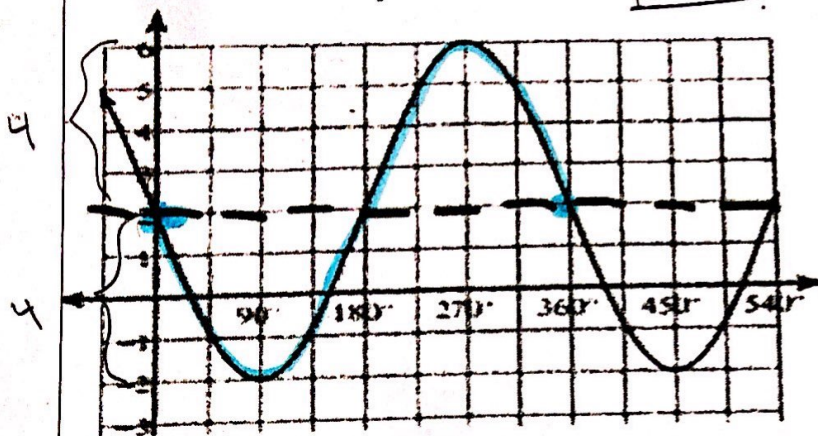
$y = \cos x$



$y = -\cos x$



Write the equation of a sine function.



Amplitude: 4
 Reflect across x-axis? yes, neg. a
 Phase Shift: none
 Domain: $[0, 360^\circ]$
 Period: $360^\circ - 0^\circ = 360^\circ$
 Vertical Shift: 2
 Range: $[-2, 6]$

$$y = a \sin b(\theta - c) + d$$

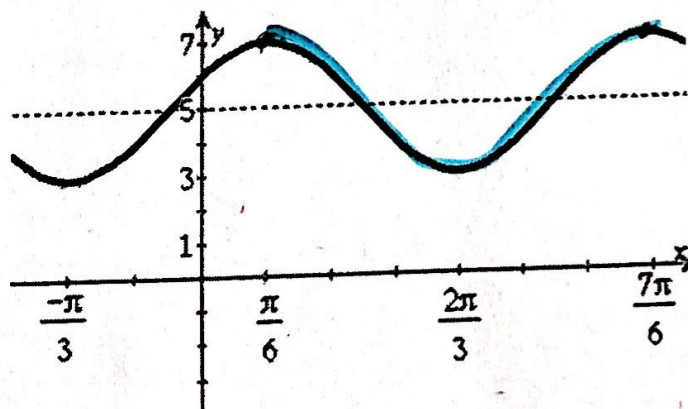
$$y = -4 \sin 1(\theta - 0^\circ) + 2$$

$$b = \frac{360^\circ}{\text{period}} = \frac{360^\circ}{360^\circ} = 1$$

$$y = -4 \sin \theta + 2$$

OR $y = -4 \sin(\theta) + 2$

Write the equation of a cosine function.



Amplitude: 2
 Reflect across x-axis? no
 Phase Shift: $\frac{\pi}{6}$
 Domain: $[\frac{\pi}{6}, \frac{7\pi}{6}]$
 Period: $\frac{7\pi}{6} - \frac{\pi}{6} = \frac{6\pi}{6} = \pi$
 Vertical Shift: 5
 Range: $[3, 7]$

$$y = a \cos b(x - c) + d$$

$$y = 2 \cos 2(x - \frac{\pi}{6}) + 5$$

$$b = \frac{2\pi}{\text{period}} = \frac{2\pi}{\pi} = 2$$