2.3 Writing Equations of Sinusoids from Graphs

Essential Question: How do I write an equation of a sinusoidal function given a graph?

$$y = C + A\sin B(x - D)$$

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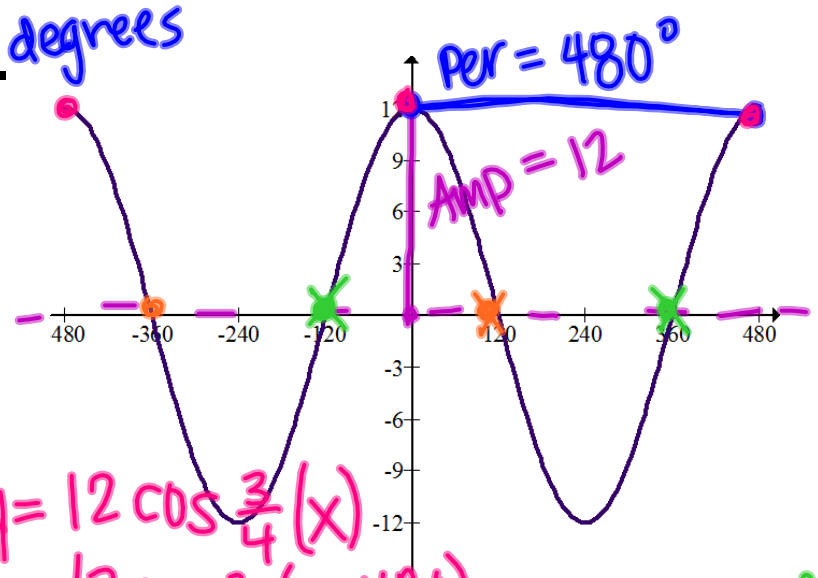
1. degrees



$y = C + A\sin B(x - D)$

$A = 12$ $C = 0$ $B = \frac{360}{480} = \frac{3}{4}$

$B \cdot per = \frac{360}{B} \cdot B$

$\frac{B \cdot per}{per} = \frac{360}{per}$

$B = \frac{360}{per.}$

sine = mid.

$D = -120$

$\boxed{y = 12\sin\frac{3}{4}(x+120)}$

$(x-360)$

$y = 12\cos\frac{3}{4}(x)$

$y = 12\cos\frac{3}{4}(x-480)$

neg. $y = -12\sin\frac{3}{4}(x-120)$

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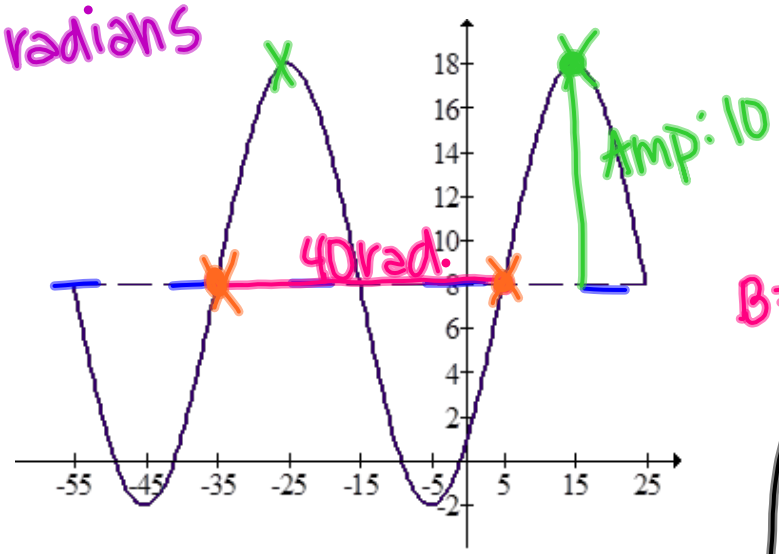
2. radians



$y = C + A\sin B(x - D)$

$C = 8$, $A = 10$, $B = \frac{\pi}{20}$

$B = \frac{2\pi}{40} = \frac{\pi}{20}$

D: sin −35 or 5

cos −25 or 15

$$y = 8 + 10\sin\frac{\pi}{20}(x+35)$$

$$y = 8 + 10\cos\frac{\pi}{20}(x-15)$$

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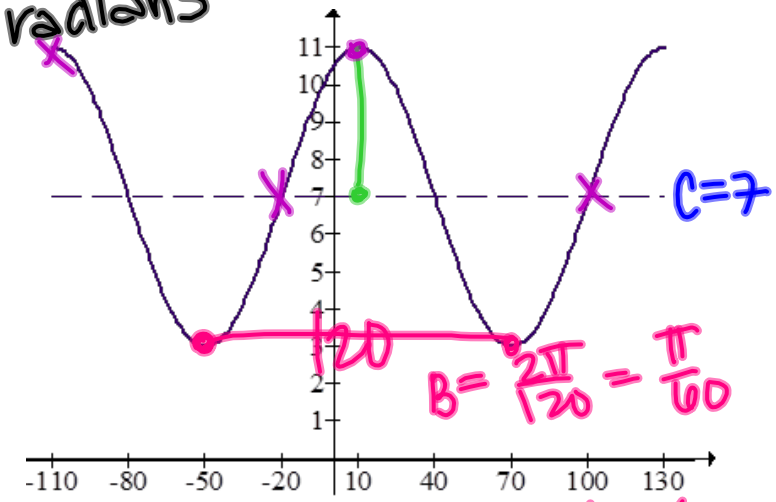
3. radians



$B = \frac{2\pi}{120} = \frac{\pi}{60}$

A & C values – y-axis

B & D values – x-axis

$y = C + A\sin B(x - D)$

$C = 7$, $A = 4$, $B = \frac{\pi}{60}$

D: sin −20 or 100
cos −110 or 10

$y = 7 + 4\sin\frac{\pi}{60}(x+20)$

$y = 7 + 4\cos\frac{\pi}{60}(x-10)$