

October 2

Write an equation for a cosine graph with
Amplitude = 2, Period = 6,
Horizontal Shift = 1 and Vertical Shift = -5

$$y = 2 \cos(12\pi x - 12\pi) - 5$$

$$y = 2 \cos\left(\frac{1}{3}\pi x + 1\right) - 5$$

$$y = 2 \cos\left(\frac{\pi}{3}x - \frac{\pi}{3}\right) - 5$$

$$y = 2 \cos\left(\frac{\pi}{3}x - \frac{1}{6}\right) - 5$$

$$B: \frac{2\pi}{B} = 6 \cdot B$$

$$\frac{2\pi}{6} = \frac{6B}{6}$$

$$B = \frac{2\pi}{6} = \frac{\pi}{3} = \frac{1}{3}\pi$$

$$\frac{\pi}{3} \cdot \frac{-C}{\frac{\pi}{3}} = 1 \cdot \frac{\pi}{3}$$

$$-C = \frac{\pi}{3}$$

$$C = -\frac{\pi}{3}$$

October 2

Students will verbally explain how to
graph sine and cosine functions
(using the words:
range, period, vertical shift, horizontal shift...)

Evaluate $\sin\left(\frac{8\pi}{3}\right)$
(Use its period as an aid.)

Enter expression

Evaluate $\cos\left(\frac{-9\pi}{4}\right)$
(Use its period as an aid.)

Enter expression

$$\begin{aligned} -\frac{9\pi}{4} + 2\pi &= -\frac{9\pi}{4} + \frac{8\pi}{4} = -\frac{\pi}{4} \\ -\frac{\pi}{4} + 2\pi &= -\frac{\pi}{4} + \frac{8\pi}{4} = \frac{7\pi}{4} \\ \cos\left(-\frac{9\pi}{4}\right) &= \cos\left(-\frac{\pi}{4}\right) = \cos\left(\frac{7\pi}{4}\right) = \frac{\sqrt{2}}{2} \end{aligned}$$

Evaluate $\sin\left(\frac{-8\pi}{3}\right)$
(Use its period as an aid.)

Enter expression

Evaluate $\sin\left(\frac{19\pi}{6}\right)$
(Use its period as an aid.)

Enter expression

$$\begin{aligned} \frac{19\pi}{6} - 2\pi &= \frac{19\pi}{6} - \frac{12\pi}{6} = \frac{7\pi}{6} \\ \sin\left(\frac{19\pi}{6}\right) &= \sin\left(\frac{7\pi}{6}\right) = -\frac{1}{2} \end{aligned}$$

Evaluate $\sin\left(\frac{8\pi}{3}\right)$
(Use its period as an aid.)

Enter expression

Evaluate $\cos\left(\frac{-9\pi}{4}\right)$
(Use its period as an aid.)

Enter expression

Evaluate $\sin\left(\frac{-8\pi}{3}\right)$
(Use its period as an aid.)

Enter expression

$$\begin{aligned} -\frac{8\pi}{3} + 2\pi &= -\frac{8\pi}{3} + \frac{6\pi}{3} = -\frac{2\pi}{3} \\ -\frac{2\pi}{3} + 2\pi &= -\frac{2\pi}{3} + \frac{6\pi}{3} = \frac{4\pi}{3} \\ \sin\left(-\frac{8\pi}{3}\right) &= \sin\left(-\frac{2\pi}{3}\right) = \sin\left(\frac{4\pi}{3}\right) = -\frac{\sqrt{3}}{2} \end{aligned}$$

Evaluate $\sin\left(\frac{19\pi}{6}\right)$
(Use its period as an aid.)

Enter expression

$$\begin{aligned} \frac{19\pi}{6} - 2\pi &= \frac{19\pi}{6} - \frac{12\pi}{6} = \frac{7\pi}{6} \\ \sin\left(\frac{19\pi}{6}\right) &= \sin\left(\frac{7\pi}{6}\right) = -\frac{1}{2} \end{aligned}$$

Evaluate $\sin\left(\frac{8\pi}{3}\right)$
(Use its period as an aid.)

Enter expression $\frac{8\pi}{3} - 2\pi = \frac{8\pi}{3} - \frac{6\pi}{3} = \frac{2\pi}{3}$

$$\sin\left(\frac{8\pi}{3}\right) = \sin\left(\frac{2\pi}{3}\right) = \frac{\sqrt{3}}{2}$$

Evaluate $\cos\left(\frac{-9\pi}{4}\right)$
(Use its period as an aid.)

Enter expression $-\frac{9\pi}{4} + 2\pi = -\frac{9\pi}{4} + \frac{8\pi}{4} = -\frac{\pi}{4}$

$$\cos\left(-\frac{9\pi}{4}\right) = \cos\left(-\frac{\pi}{4}\right) = \cos\left(\frac{\pi}{4}\right) = \frac{\sqrt{2}}{2}$$

Evaluate $\sin\left(\frac{-8\pi}{3}\right)$
(Use its period as an aid.)

Enter expression

Evaluate $\sin\left(\frac{19\pi}{6}\right)$
(Use its period as an aid.)

Enter expression

Sketch two cycles
of the graph of
 $y = 2\cos(8x)$

$$A=2 \xrightarrow{①} \text{range: } -2 \leq y \leq 2$$

$$B=8$$

$$C=0$$

$$D=0 \xrightarrow{②} \text{range: } -2+0 \leq y \leq 2+0$$

$$\boxed{-2 \leq y \leq 2}$$

$$③ \text{ Period} = \frac{2\pi}{B}$$

$$\frac{2\pi}{8} = \frac{\pi}{4}$$

$$\boxed{\text{Start: } 0}$$

$$\boxed{\text{Middle: } \frac{\pi}{8}}$$

$$\boxed{\text{End: } \frac{\pi}{4}}$$

$$\boxed{1^{\text{st}} \text{ Quarter: } \frac{\pi}{16}}$$

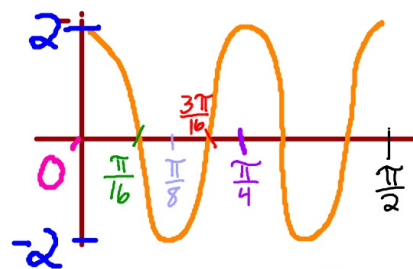
$$\frac{0 + \frac{\pi}{8}}{2} = \frac{\frac{\pi}{8}}{2} = \frac{\pi}{8} \cdot \frac{1}{2} = \frac{\pi}{16}$$

$$\boxed{3^{\text{rd}} \text{ Quarter: } \frac{3\pi}{16}}$$

$$\frac{\frac{\pi}{8} + \frac{\pi}{4}}{2} = \frac{\frac{\pi}{8} + \frac{2\pi}{8}}{2} = \frac{\frac{3\pi}{8}}{2} = \frac{3\pi}{8} \cdot \frac{1}{2} = \frac{3\pi}{16}$$

$$④ \text{ H.S.} = -\frac{C}{B}$$

$$\frac{-0}{8} = 0$$



End of 2nd cycle =
period + (end of 1st cycle)

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