October 1

How can you change a sine equation into a cosine equation for the same graph?

add $\frac{\pi}{2}$ to the c value

(or subtract)

change the sign of the amplitude

October 1

Students will verbally explain how to graph sine and cosine functions

(using the words:
range, period, vertical shift, horizontal shift...)

6. The function shown on this page has the equation **f1**$(x) = -1.5\sin\left(x+\frac{\pi}{4}\right)+4$. Write an equation for a cosine function that will have the same graph.

$1.5\cos\left(x+\frac{\pi}{4}\right)+4$ $-1.5\cos\left(x-\frac{\pi}{4}\right)+4$

$1.5\cos\left(x+\frac{3\pi}{4}\right)+4$

$\frac{\pi}{4}+\frac{\pi}{2}=\frac{\pi}{4}+\frac{2\pi}{4}=\frac{3\pi}{4}$

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

7. The function shown on this page has the equation **f2**$(x) = 3\sin(2x) - 5$. Write an equation for a cosine function that will have the same graph.

$3\cos(2x-1.5)-5$

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

subtract $\frac{\pi}{2}$, A stays the same

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

add $\frac{\pi}{2}$, A changes sign

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6. The function shown on this page has the equation **f1**$(x) = -1.5\sin\left(x+\frac{\pi}{4}\right)+4$. Write an equation for a cosine function that will have the same graph.

$y=1.5\cdot\cos\left(x-\frac{\pi}{4}\right)+4$ $y=-1.5\cdot\cos\left(x+\frac{2\cdot\pi}{4}\right)+4$

$y=1.5\cdot\cos\left(x+\frac{\pi}{2}\right)+4$ $y=-1.5\cdot\cos\left(x-\frac{\pi}{4}\right)+4$

$y=1.5\cdot\cos(1\cdot x-7)+4$

$\frac{\pi}{4}+\frac{\pi}{2}=\frac{\pi}{4}+\frac{2\pi}{4}=\frac{3\pi}{4}$

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

$y=1.5\cos\left(x+\frac{3\pi}{4}\right)+4$

7. The function shown on this page has the equation **f2**$(x) = 3\sin(2x) - 5$. Write an equation for a cosine function that will have the same graph.

$y=3\sin(2x)-5$

$y=3\cdot\cos(2\cdot x)$

$y=-3\cdot\cos(2\cdot x)-5$

$y=3\cdot\cos(2\cdot x-1.6)-5$

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

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

8. a. Write an equation for a sine function with an amplitude of 4, a period of 12, a horizontal shift of 2, and a vertical shift of 3.

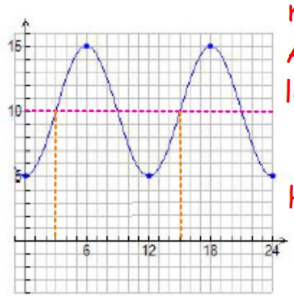
$$y = 4\sin\left(\frac{\pi}{6}x - \frac{\pi}{3}\right) + 3$$

b. Write an equation for a cosine function with the same parameters as the sine function in part (a).

$$y = -4\cos\left(\frac{\pi}{6}x + \frac{\pi}{6}\right) + 3$$

$$y = 4\cos\left(\frac{\pi}{6}x - \frac{5\pi}{6}\right) + 3$$

9. a. Write an equation for the sine function whose graph is shown in the figure below.



midline: y = 10 --> Vertical Shift = D = 10

Amplitude = A = 5

length of one cycle = 12

$\frac{2\pi}{B} = 12$ --> $B = \frac{\pi}{6}$

Horizontal Shift = 3

$\frac{-C}{B} = 3$ --> $C = \frac{-\pi}{2}$

$$y = 5\sin\left(\frac{\pi}{6}x - \frac{\pi}{2}\right) + 10$$

b. Utilize a cosine function to write an equation for the same graph.

$$y = -5\cos\left(\frac{\pi}{6}x\right) + 10$$

$$y = 5\cos\left(\frac{\pi}{6}x - \pi\right) + 10$$

pg 166 #3 - 12 (multiples of 3), 17, 19, 21,
43, 45, 48, 49, 51, 54, 55, 57, 58

$$\cos\left(\frac{x}{2}\right) = \cos\left(\frac{1}{2}x\right)$$