Write an equation in factored form for each sine function that has the given values.

Justify your answers by showing work when finding the k value!

(Hint: use given value for period, set equal to $\dfrac{2\pi}{k}$, then cross multiply to find k.)

use
opposite
value

H. amplitude = 2, period = 3π, horizontal shift = -π

$$y = \pm 2\sin \frac{2}{3}(x + \pi)$$

$$\frac{2\pi}{k} = \frac{3\pi}{1}$$

I. amplitude = 2, period = 4π, horizontal shift = π, vertical shift = -1

J. amplitude = $\dfrac{1}{2}$, period = $\dfrac{\pi}{4}$, horizontal shift = 0, vertical shift = 3

K. amplitude = $\dfrac{1}{2}$, period = $\dfrac{\pi}{2}$, horizontal shift = 2π, vertical shift = -3

extra practice #11

Write the equation in factored form (factor the k value), then state the **amplitude, period, horizontal and vertical shift** for each function. Sketch a graph on the back of this sheet for the given increments.

11. $y = -2\cos\left(\frac{1}{4}x + \frac{\pi}{2}\right) + 1$

$y = -2\cos\frac{1}{4}\left(x + 2\pi\right) + 1$ as is

← k   ↓ opposite
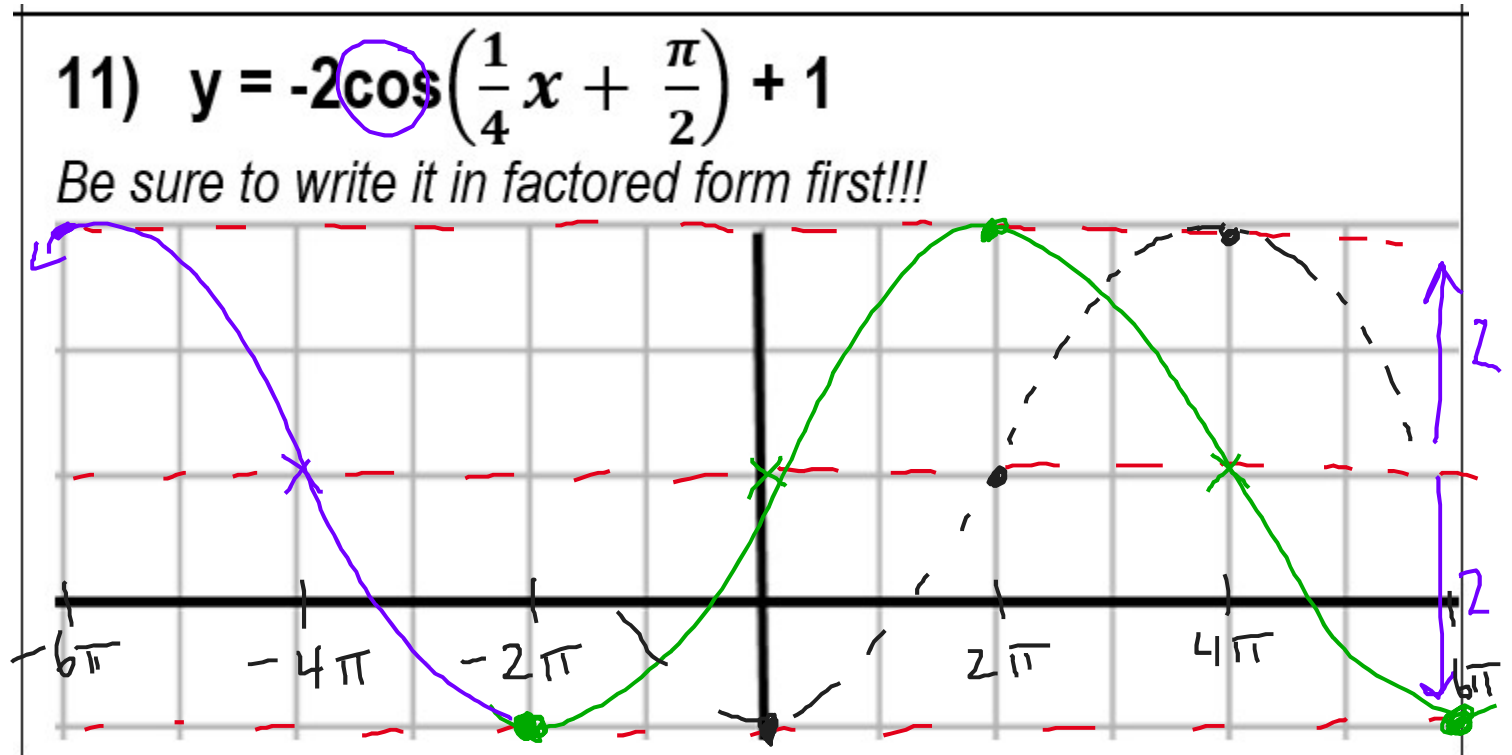
flip $\boxed{Amp = 2}$ $per = \dfrac{2\pi}{\frac{1}{4}} = 2\pi \cdot \frac{4}{1} = \boxed{8\pi}$

horizontal shift $= \boxed{-2\pi}$ h.s.

vertical shift $= \boxed{1}$

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

extra practice #11

11) $y = -2\cos\left(\dfrac{1}{4}x + \dfrac{\pi}{2}\right) + 1$
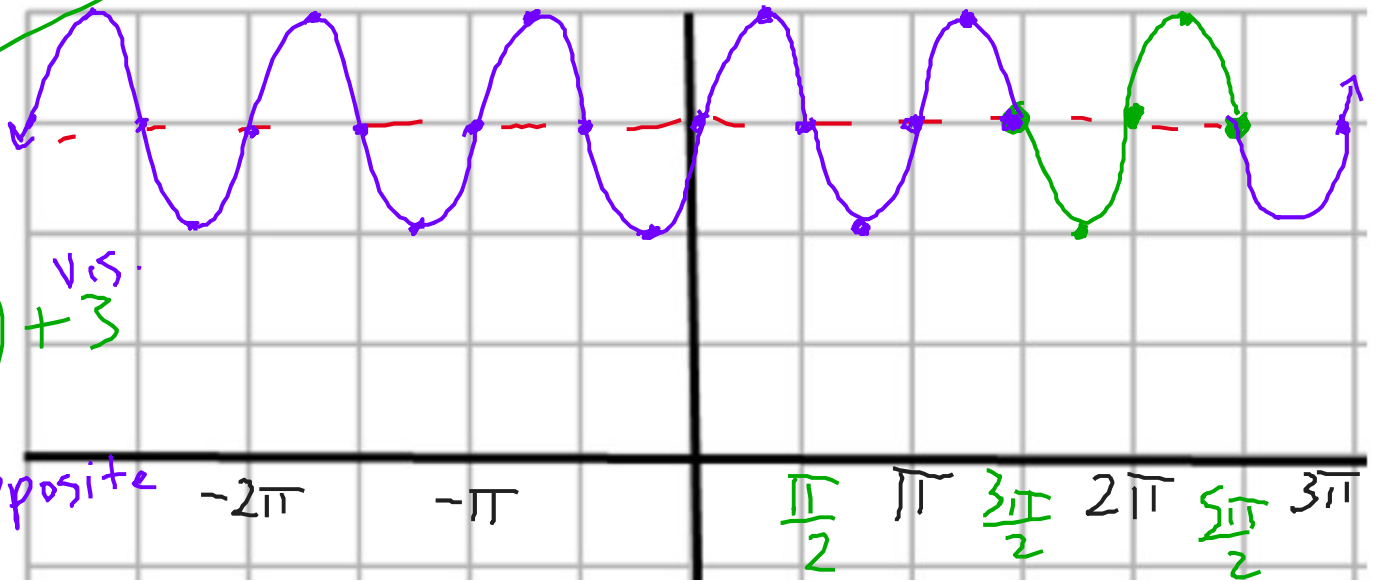
Be sure to write it in factored form first!!!

*factor k
*identify amp, per, vertical/horizontal shift
*sketch graph across given interval

extra practice #12

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

Be sure to write it in factored form first!!!

$y = \overset{\text{flip}}{-}\sin \overset{k}{2}\left(x - \dfrac{3\pi}{2}\right) \overset{\text{v.s.}}{+} 3$

Opposite

Amp = 1

Per $= \dfrac{2\pi}{2} = \pi$

h.s $= \dfrac{3\pi}{2}$ right

v.s. $= 3$ up

-2π $-\pi$ $\dfrac{\pi}{2}$ π $\dfrac{3\pi}{2}$ 2π $\dfrac{5\pi}{2}$ 3π
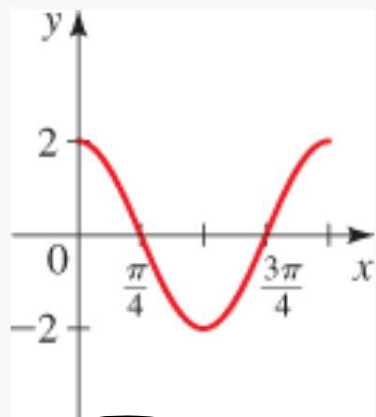
*factor k
*identify amp, per, vertical/horizontal shift
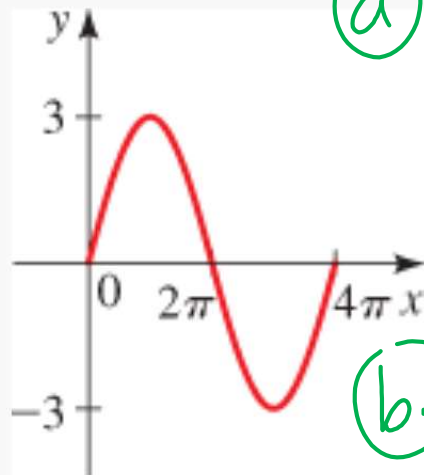*sketch graph across given interval

48.

(a) Amp = 2
Per = π
h s = 0

(b) $y = 2\cos 2x$

Check even answers for 53

50.

(a) Amp = 3
Per = 4π
h s. = 0

(b) $y = 3\sin\frac{1}{2}x$