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Sinusoid: Word to describe a sine or cosine graph

$$f(x) = a\sin(b(x-h))+k$$

a: Amplitude

b: Period Finder

h: Phase Shift

k: Vertical Shift

Period: $\frac{2\pi}{|b|}$

amplitude is half the difference between the max and min on a sine or cosine graph (a vertical stretch or shrink) (the height of one mountain or valley from the midline)

what does it mean if the "a" is negative??

$$y = a \sin x$$

Period:

what is the length of the parent period? 2π

$$y = a \sin(bx)$$

to find the new period: parent period divided by "b"

$$\frac{2\pi}{|b|}$$

Frequency: the reciprocal of the period - it's the number of cycles the wave completes in 1 unit interval

what is the frequency of the parent wave?

$$y = a \sin (bx)$$

to find the frequency: "b" divided by 2π

What is the period?

$y = \sin x$

2π

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

$\frac{2\pi}{|b|} = \frac{2\pi}{|1/3|}$

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

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

$\frac{2\pi}{|b|} = \frac{2\pi}{|-2|}$

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

Phase Shift - is used to describe moves left and right always factor out b

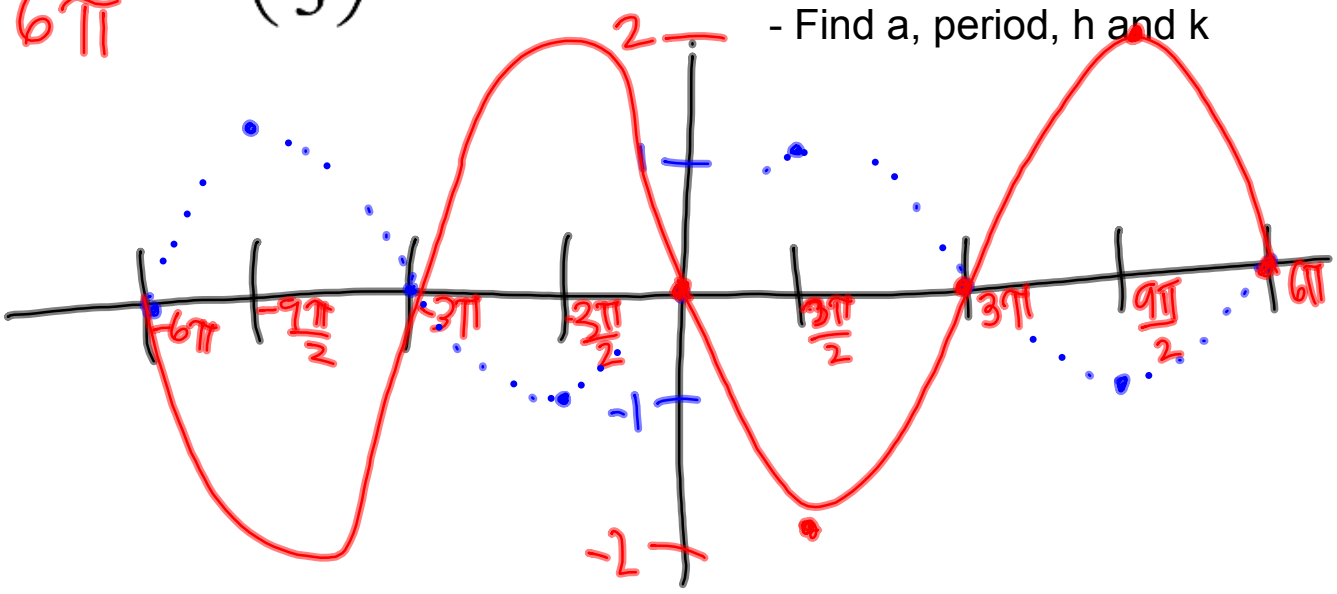
Vertical Shift - is used to describe moves up and down

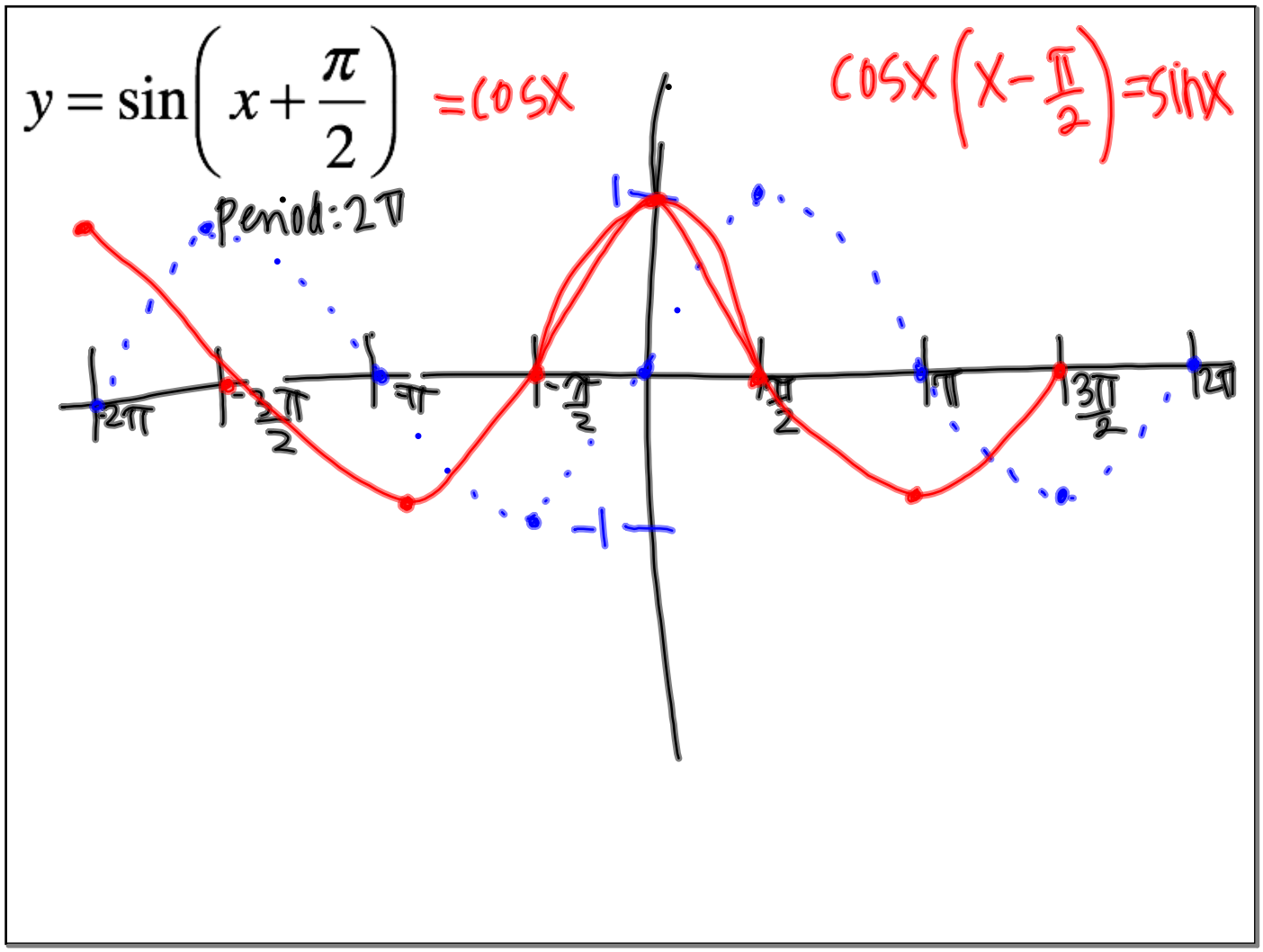
Graphing

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

6π

- Always graph 2 periods
- Make 4 tick marks each direction
  - -the last one: period
- Find a, period, h and k




$y = \sin\left(x + \frac{\pi}{2}\right)$
$= \cos x$
$\cos x\left(x - \frac{\pi}{2}\right) = \sin x$
Period: 2π
-2π
$-\frac{3\pi}{2}$
$-\pi$
$-\frac{\pi}{2}$
$\frac{\pi}{2}$
π
$\frac{3\pi}{2}$
2π
1
-1