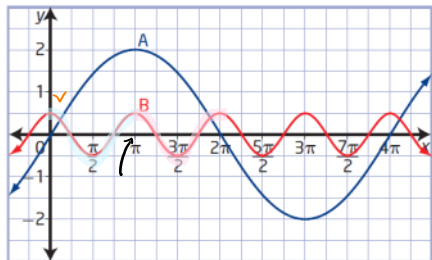


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10. a) Determine the period and the amplitude of each function in the graph.



- b) Write an equation in the form $y = a \sin bx$ or $y = a \cos bx$ for each function.
- c) Explain your choice of either sine or cosine for each function.

red foo
looks like
a cos. b/c it starts at (0,1)
↳ $\cos x$ has one trough
(0,1) one period.
it looks like the period is $[0, \pi]$

10. a) Graph A: Amplitude is 2 and period is 4π . Graph B: Amplitude is 0.5 and period is π .
- b) Graph A: $y = 2 \sin \frac{1}{2}x$; Graph B: $y = 0.5 \cos 2x$
- c) Graph A starts at 0, so the sine function is the obvious choice. Graph B starts at 1, so the cosine function is the obvious choice.

$$\cos bx \rightarrow P = \frac{2\pi}{b}$$

period calc

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

solve for b:

$$\frac{2\pi}{b} = \pi \quad | : \pi$$

$$\frac{2}{b} = 1 \quad | \cdot b$$

$$\frac{2 \cdot b}{b} = 1 \cdot b$$

$$\Rightarrow \boxed{b=2}$$

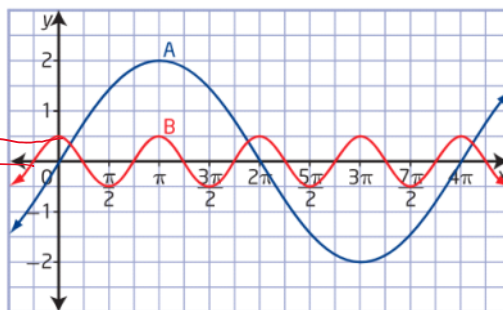
the red function
 $\therefore \cos bx = \cos 2x$

what is the amplitude? $\equiv$ vert. stretch.

$$\therefore y = a \cdot \cos 2x$$

$$a = 0.5$$

$$\therefore y = 0.5 \cos 2x$$



$$a = 0.5$$

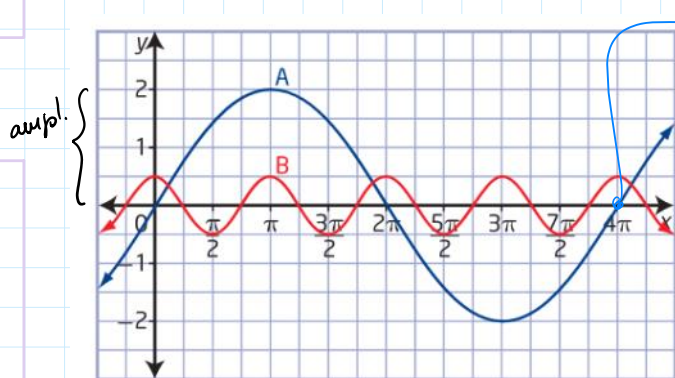
$$y = 0.5 \cdot \cos 2x$$

graph B



10. a) Graph A: Amplitude is 2 and period is 4π . Graph B: Amplitude is 0.5 and period is π .
 b) Graph A: $y = 2 \sin \frac{1}{2}x$; Graph B: $y = 0.5 \cos 2x$
 c) Graph A starts at 0, so the sine function is the obvious choice. Graph B starts at 1, so the cosine function is the obvious choice.

The blue function:



the period:
starts at 0
ends at 4π

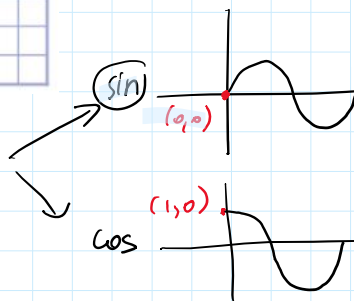
$$P = 4\pi$$

10. a) Graph A: Amplitude is 2 and period is 4π . Graph B: Amplitude is 0.5 and period is π .
 b) Graph A: $y = 2 \sin \frac{1}{2}x$; Graph B: $y = 0.5 \cos 2x$
 c) Graph A starts at 0, so the sine function is the obvious choice. Graph B starts at 1, so the cosine function is the obvious choice.

the look of sin & cos

the blue func. looks like

sin



it's amplitude = 2 = vert. stretch $\Rightarrow y = a \sin bx$

$$y = 2 \sin bx$$

$b = ?$

$$P_{orig} = 2\pi$$

$$P_{new} = \frac{P_{orig}}{b} = \frac{2\pi}{b} \text{ we know this is } 4\pi$$

graph A (blue)

10. a) Graph A: Amplitude is 2 and period is 4π . Graph B: Amplitude is 0.5 and period is π .
 b) Graph A: $y = 2 \sin \frac{1}{2}x$; Graph B: $y = 0.5 \cos 2x$
 c) Graph A starts at 0, so the sine function is the obvious choice. Graph B starts at 1, so the cosine function is the obvious choice.

$$\therefore 4\pi = \frac{2\pi}{b} \mid \times b$$

$$4\pi(b) = \frac{2\pi}{b}(b)$$

$$4\pi \cdot b = 2\pi \mid \div \pi$$

$$4 \cdot b = 2 \mid \div 4$$

$$b = \frac{2}{4} = \frac{2 \div 2}{4 \div 2}$$

$$b = \frac{1}{2}$$

another way to solve

$$\frac{4\pi}{1} = \frac{2\pi}{b}$$

$$b = \frac{1 \times 2\pi}{4\pi} = \frac{2}{4} = \frac{1}{2}$$

$$b = \frac{1}{2}$$

$$4 - \frac{1}{4} = \frac{15}{4}$$

$\Rightarrow$ $y = 2 \sin \frac{1}{2} x$ is the blue function.

graph B

10. a) Graph A: Amplitude is 2 and period is 4π . Graph B: Amplitude is 0.5 and period is π .
 b) Graph A: $y = 2 \sin \frac{1}{2} x$; Graph B: $y = 0.5 \cos 2x$
 c) Graph A starts at 0, so the sine function is the obvious choice. Graph B starts at 1, so the cosine function is the obvious choice.