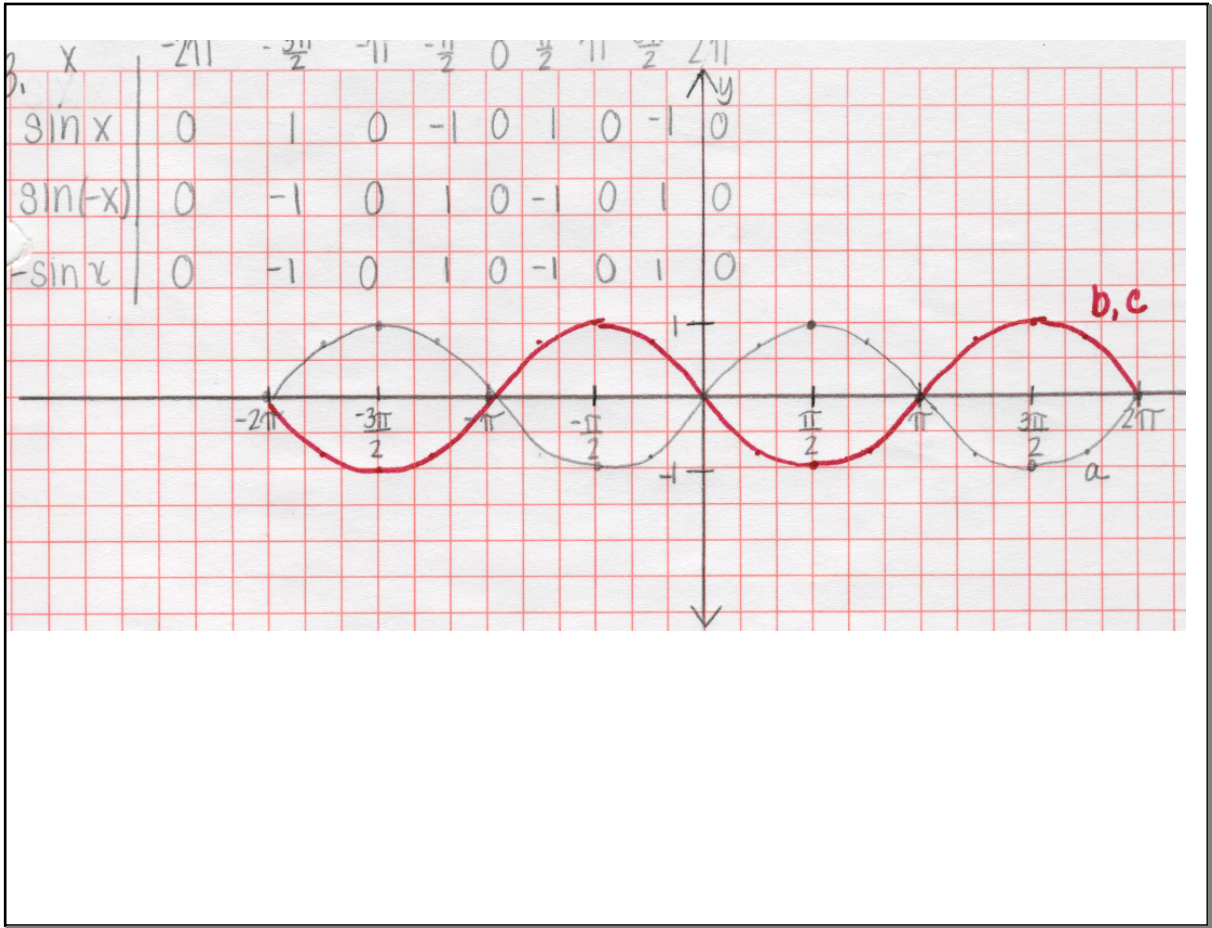
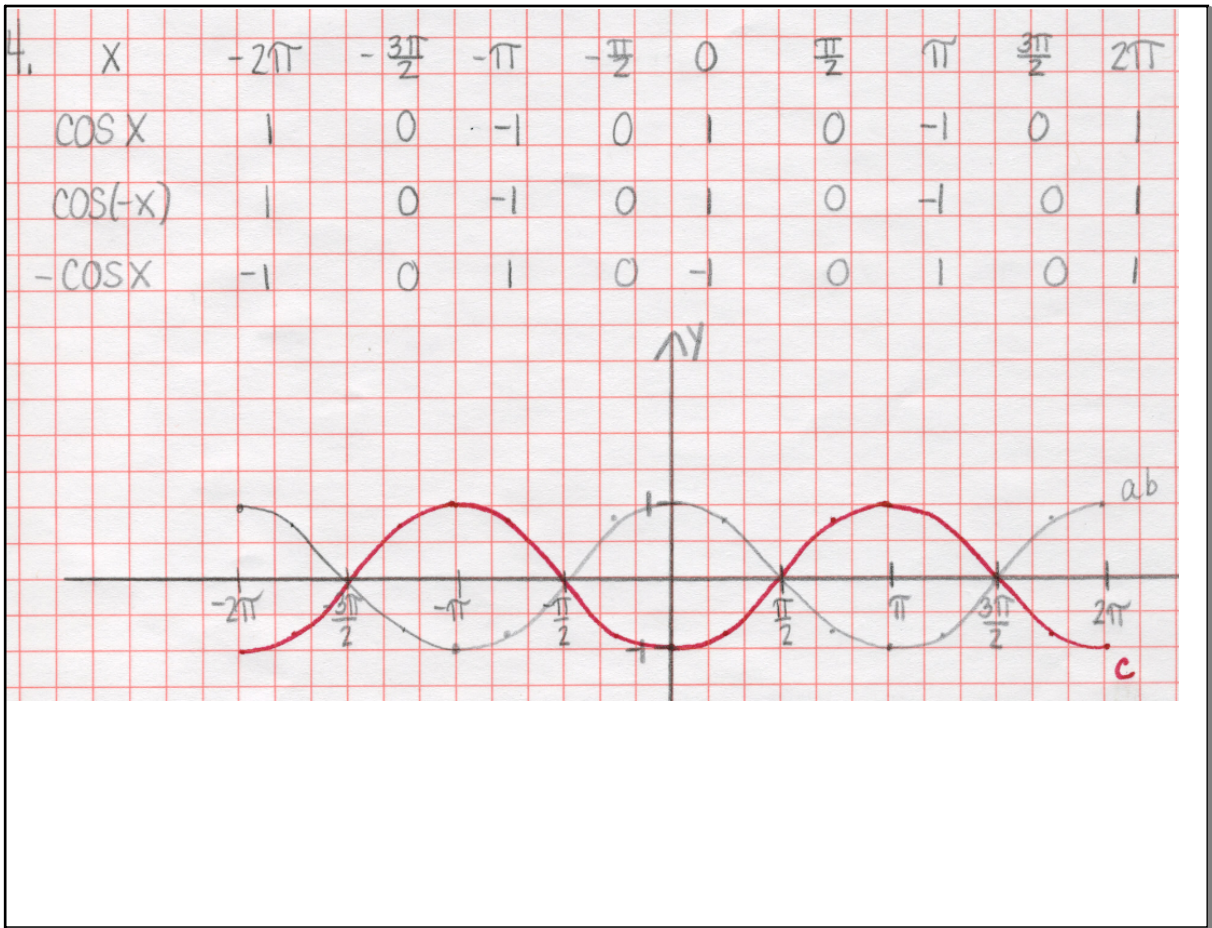




Dec 16-7:25 AM



Dec 16-7:25 AM

Translations



...and to think, we both evolved from a single cell!

Dec 3-9:57 AM

$$y = A\cos(bx + c) + d$$

$$y = A\sin(bx + c) + d$$

$y = A\cos(bx + c) + d \rightarrow$ describes a curve that starts at $A + d$
y: cos x starts @ 1

$y = A\sin(bx + c) + d \rightarrow$ describes a curve that starts at $0 + d$
y: sin x starts @ 0.

Amplitude = $|A|$ *how high/low?*

Vertical Shift = d

Period = $\frac{2\pi}{b}$ *The length of 1 cos/sin cycle "How long?"*

Phase Shift = $-\frac{c}{b}$

Frequency = $\frac{1}{\text{period}}$ *The number of cycles of sin/cos over 2π "How many?"*

horizontal shift

Dec 3-10:03 AM

Find the amplitude, vertical shift, range, period, frequency and phase shift:

1. $y = 7 \cos\left(\frac{\pi x}{2} + \frac{\pi}{4}\right)$

amp = $|7| = 7$

range = $[-7, 7]$

period = $\frac{2\pi}{b} = \frac{2\pi}{\frac{\pi}{2}} = 2\pi \cdot \frac{2}{\pi} = 4$

frequency = $\frac{1}{\text{period}} = \frac{1}{4}$

phase shift = $-\frac{c}{b} = -\left(\frac{\frac{\pi}{4}}{\frac{\pi}{2}}\right) = -\left(\frac{\pi}{4} \cdot \frac{2}{\pi}\right) = -\frac{1}{2}$

2. $y = -8 \sin(4x - \pi)$

amp = $|-8| = 8$

range = $[-8, 8]$

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

frequency = $\frac{1}{\text{period}} = \frac{1}{\frac{\pi}{2}} = \frac{2}{\pi}$

ps = $-\frac{c}{b} = -\left(\frac{-\pi}{4}\right) = \frac{\pi}{4}$

Jan 17-4:20 PM

3. $y = -4 \sin\left(3x + \frac{3\pi}{4}\right) - 1$

amp = $|-4| = 4$

vs = down 1

range = $[-4, 4] - 1$

period = $\frac{2\pi}{b} = \frac{2\pi}{3}$

frequency = $\frac{1}{\text{period}} = \frac{1}{\frac{2\pi}{3}} = \frac{3}{2\pi}$

ps = $-\frac{c}{b} = -\left(\frac{\frac{3\pi}{4}}{3}\right) = -\left(\frac{3\pi}{4} \cdot \frac{1}{3}\right) = -\frac{\pi}{4}$

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

amp = $|-2| = 2$

vs = up 5

range = $[-2, 2] + 5 \rightarrow [3, 7]$

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

frequency = $\frac{1}{\pi}$

ps = $-\left(\frac{-\frac{\pi}{6}}{2}\right) = \frac{\pi}{12}$

Jan 17-4:20 PM

5. Graph $y = 2\cos(x)$ in the interval $[-2\pi, 2\pi]$

Amp = $|2| : 2$

Range = $[-2, 2]$

3:2

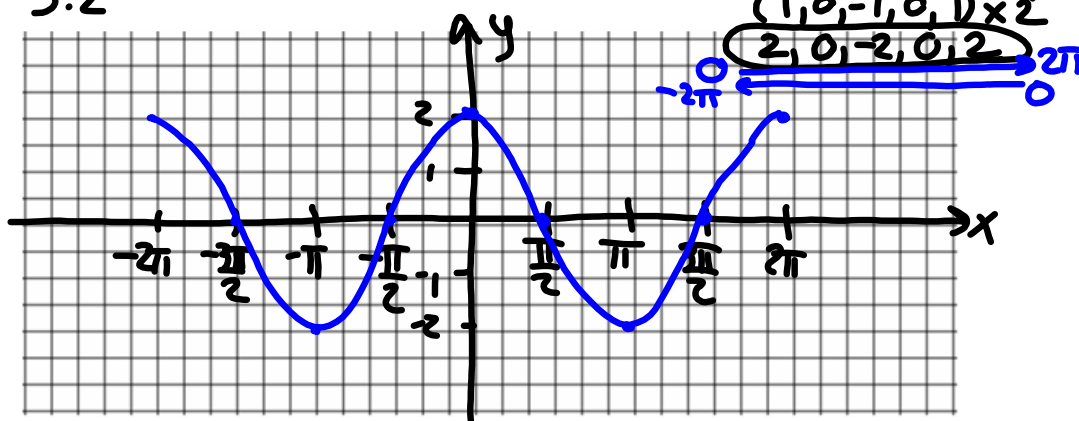
Period = $\frac{2\pi}{b} : \frac{2\pi}{1} : 2\pi$ xsc1 = $\frac{\text{period}}{4} = \frac{2\pi}{4} = \frac{\pi}{2}$

Frequency = $\frac{1}{\text{period}} : \frac{1}{2\pi} : \frac{\pi}{2}$

marking pts:

$(1, 0, -1, 0, 1) \times 2$

$(2, 0, -2, 0, 2)$



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6. Graph $y = -2\cos(x) - 1$ in the interval $[-2\pi, 2\pi]$

Amp = $| -2 | : 2$

Range = $[-2, 2]$
Subtract 1
 $[-3, 1]$

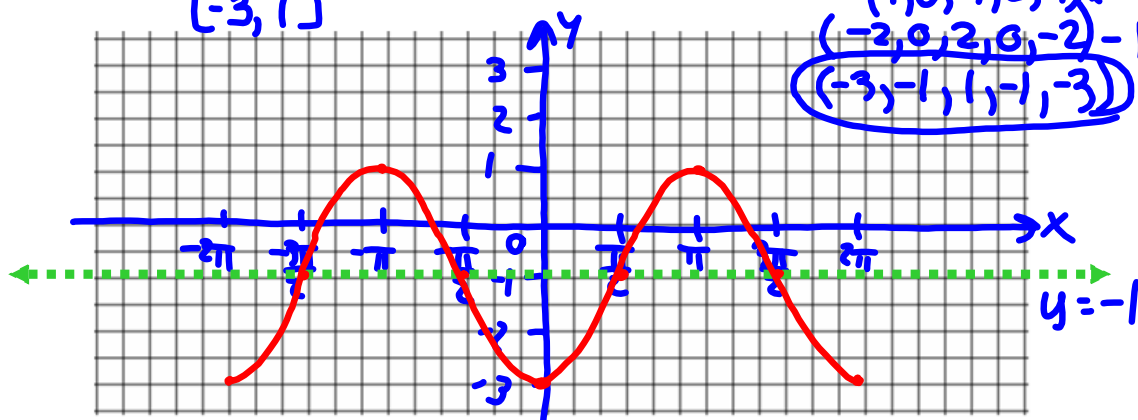
Period = $\frac{2\pi}{b} : \frac{2\pi}{1} : 2\pi$ xsc1 = $\frac{\text{period}}{4} = \frac{2\pi}{4} = \frac{\pi}{2}$

Frequency = $\frac{1}{\text{period}} : \frac{1}{2\pi} : \frac{\pi}{2}$

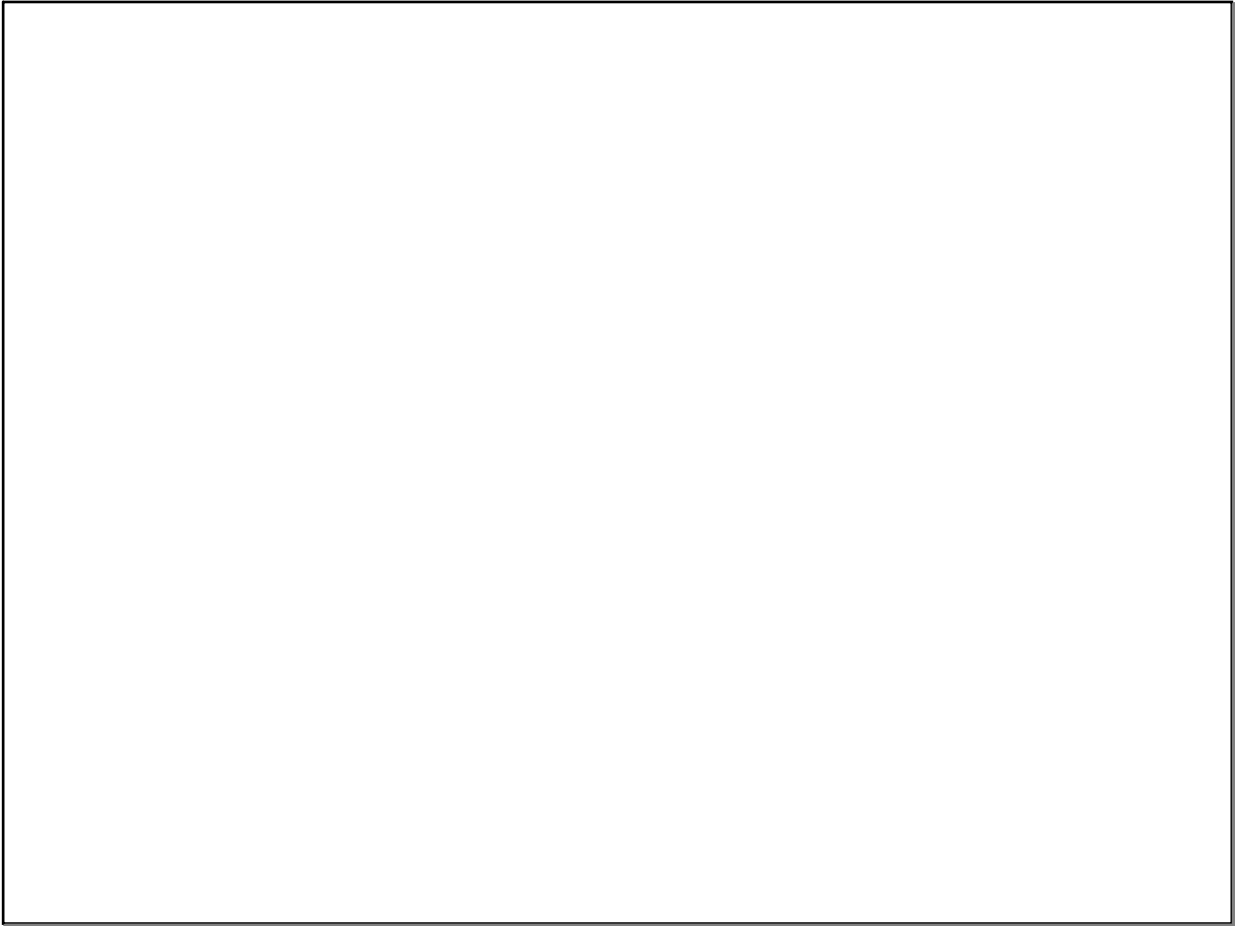
$(1, 0, -1, 0, 1) \times -2$

$(-2, 0, 2, 0, -2) - 1$

$(-3, -1, 1, -1, -3)$



Jan 17-4:24 PM



Jan 17-4:22 PM