KEY

Section 8.2: Simple Trigonometric Equations

Essential Question:
How do you graph a trig. function?

Remember: cf(x) is a vertical stretch/shrink $(x,y) \to (x, c\cdot y)$

f(cx) is a horizontal stretch/shrink $(x,y) \to \left(\frac{x}{c}, y\right)$

Ex 1:
Graph $y = \sin x$

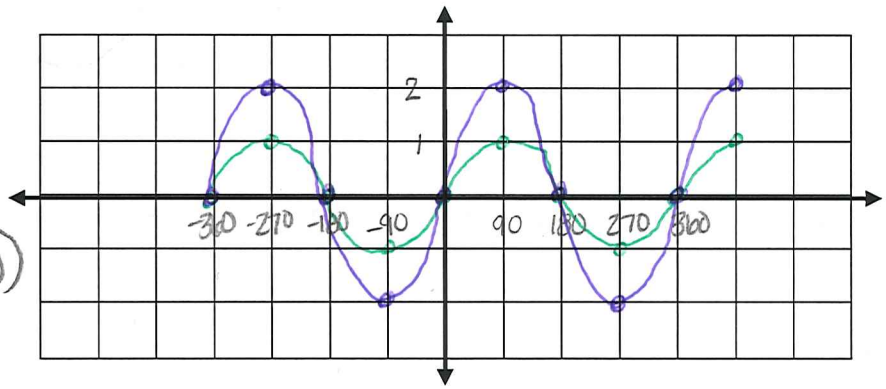
P = 360° or 2π

$A = \frac{1-(-1)}{2} = \frac{2}{2} = 1$

Graph $y = 2\sin x$ $(x, 2\cdot y)$

P = 360° or 2π

$A = \frac{2-(-2)}{2} = \frac{4}{2} = 2$

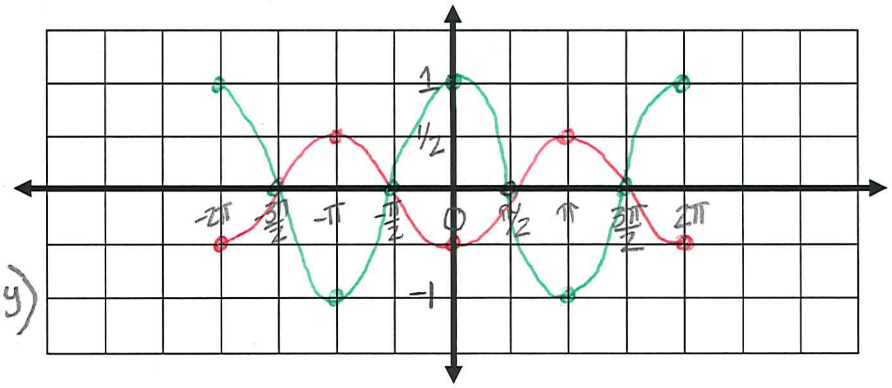


Ex 2:
Graph $y = \cos x$

P = 360° or 2π A = 1

Graph $y = -\frac{1}{2}\cos x$ $(x, -\frac{1}{2}y)$

P = 360° or 2π A = ½



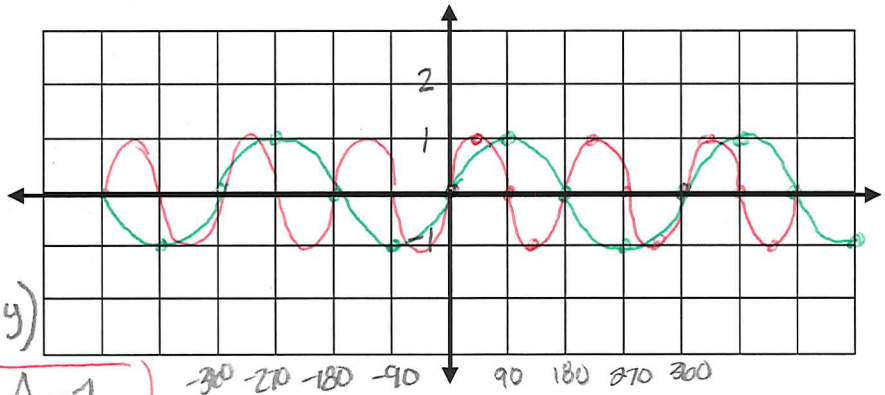
Ex 3:
Graph $y = \sin x$

P = 360 or 2π A = 1

Graph $y = \sin 2x$ $(x, y) \to \left(\frac{1}{2}x, y\right)$

$(0°, 0) \to (0, 0)$
$(90°, 1) \to (45, 1)$
$(180°, 0) \to (90, 0)$
$(270, -1) \to (135, -1)$

P = 180° or π A = 1



PERIOD and AMPLITUDE

$y = A\cdot\sin(Bx)$ $A \neq 0$ Amplitude = $|A|$

$y = A\cdot\cos(Bx)$ $B > 0$ Period = $\frac{2\pi}{B}$ or $\frac{360}{B}$

Sin value $(0°,0) \to (0,0)$ $(90°,1) \to (180,3)$ $(180°,0) \to (360,0)$ $(270°,-1) \to (540°,-3)$ $(360°,0) \to (720°,0)$

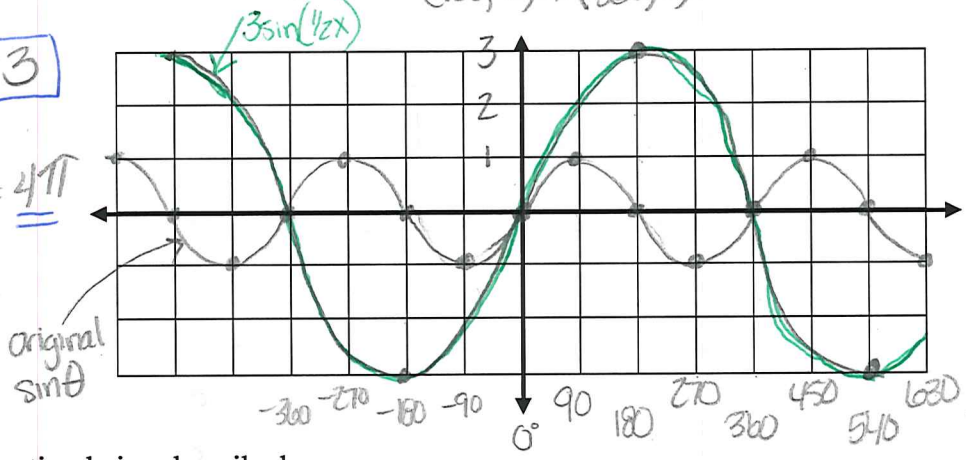
Ex 4:
Find the period and amplitude. Sketch at least one period.

$y = 3 \sin(\frac{1}{2}x)$ (A = 3, B = 1/2)

$A = |3| = 3$

$P = \frac{360}{\frac{1}{2}} = 720°$ or $\frac{2\pi}{\frac{1}{2}} = 4\pi$

$(x, y) \to (2x, 3y)$



Ex 5:
Write the equation of the trig function being described.

A sine curve varies between 3 and -3 with a period of $\frac{\pi}{6}$. $= P \to P = \frac{2\pi}{B} \to \frac{\pi}{6} = \frac{2\pi}{B}$

$y = A \cdot \sin(Bx)$

Amplitude $A = \frac{\max - \min}{2} = \frac{3 - -3}{2} = \frac{6}{2} = 3 = A$

$B\pi = 12\pi$ (÷ π) $B = 12$

$y = \pm 3 \sin(12x)$

Section 8.2 Summary:

$y = A \sin(Bx)$

$y = A \cos(Bx)$

$(x, y) \to (\frac{1}{B}x, A \cdot y)$

The original coordinate is the graph of the unit circle.

Sin curve: $(0°,0)$ $(90°,1)$ $(180°,0)$ $(270°,-1)$ $(360°,0)$...

Cos curve: $(0°,1)$ $(90°,0)$ $(180°,-1)$ $(270°,0)$ $(360°,1)$...

The amplitude is the $|A|$ and the period is $2\pi/B$ or $360/B$.