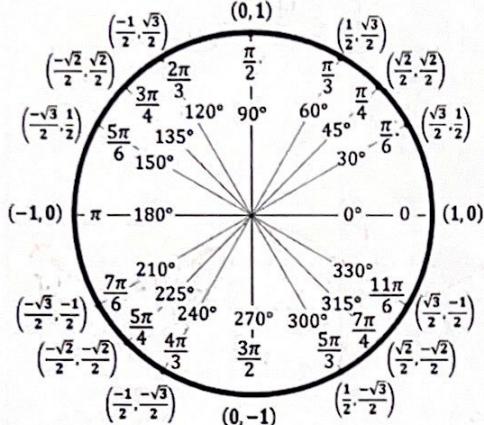


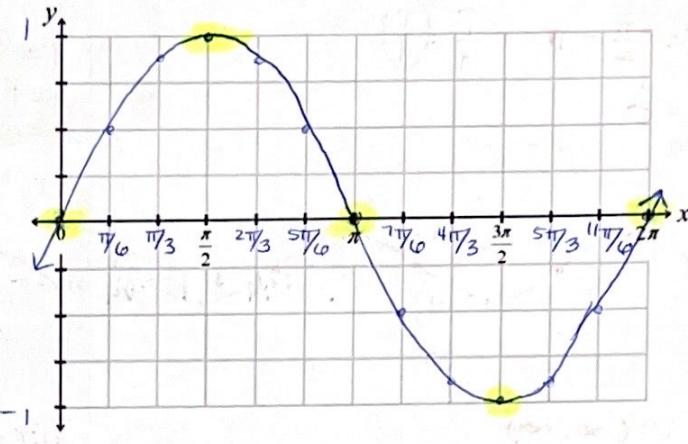
Notes: 34.2 Sine Graph

"Unwrapping" Sine from the Unit Circle:

On the Unit Circle: $x = \cos \theta$ & $y = \sin \theta$



On the Sine Graph: $x = \theta$ from Unit Circle & $y = \sin \theta$ from Unit Circle

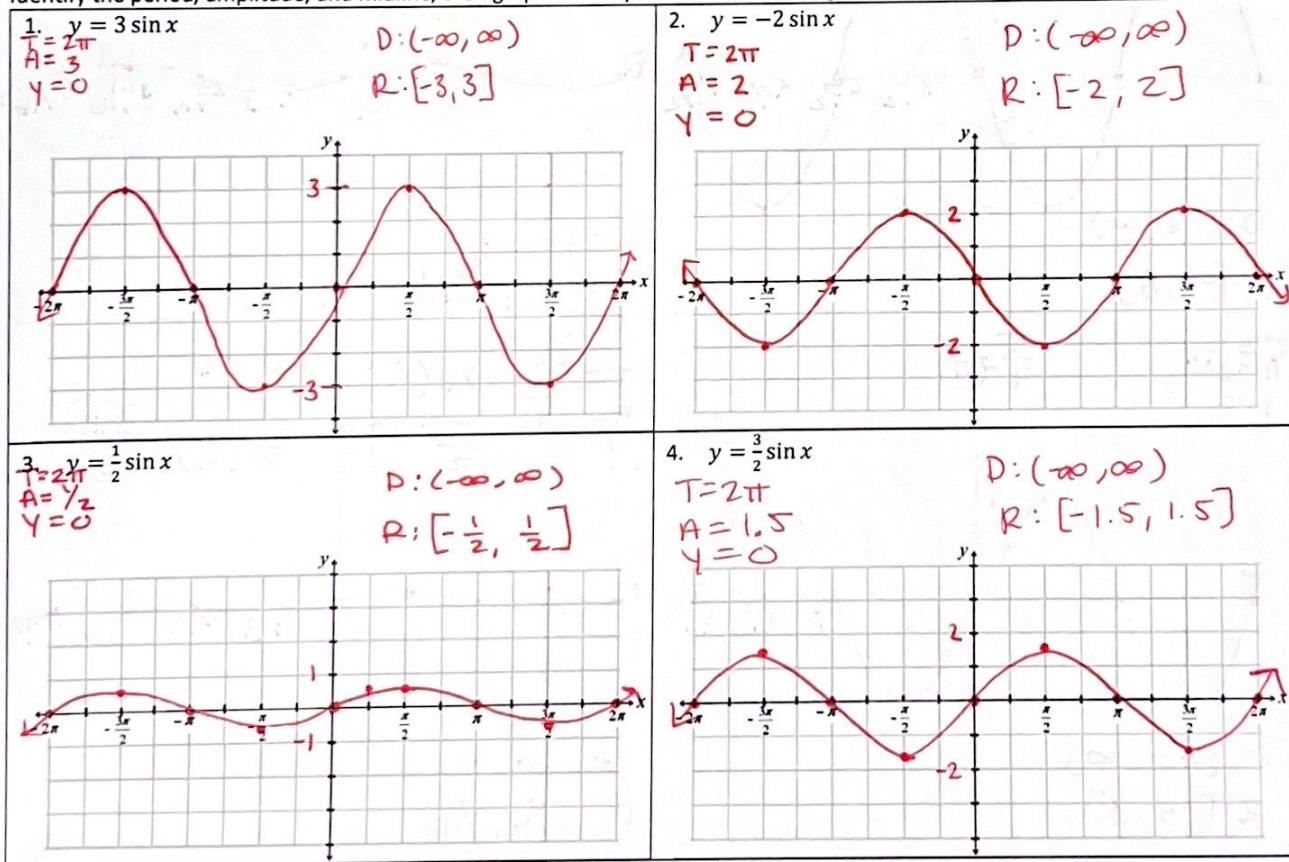


Key Points for Sine: $(0, 0)$ $(\frac{\pi}{2}, 1)$ $(\pi, 0)$ $(\frac{3\pi}{2}, -1)$ $(2\pi, 0)$

Amplitude Changes (Vertical stretch and shrink):

- $y = A \sin(x)$
- The distance from the midline to the top (or midline to the bottom) is A OR multiply the y-values by A

Identify the period, amplitude, and midline, then graph. Identify the domain and range.

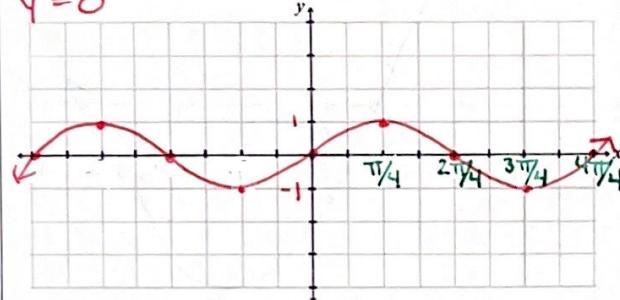


Period Changes (horizontal stretch and shrink):

- $y = A \sin(Bx)$
- The period becomes $T = \frac{2\pi}{B}$ (the new width of one cycle/boxed section/etc.) OR multiply the x-values by $\frac{1}{B}$

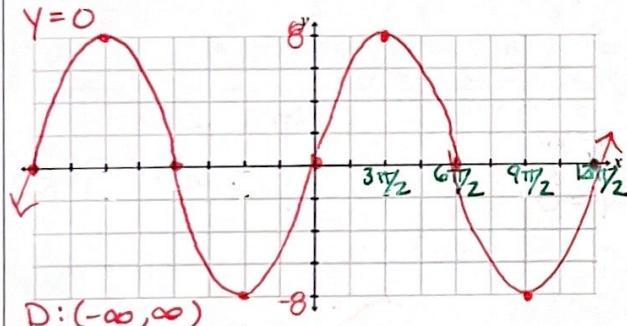
Identify the period, amplitude, and midline, then graph. Identify the domain and range.

5. $y = \sin(2x)$
 $T = \frac{2\pi}{2} = \pi$ $\frac{T}{4} = \frac{\pi}{4}$
 $A = 1$
 $y = 0$



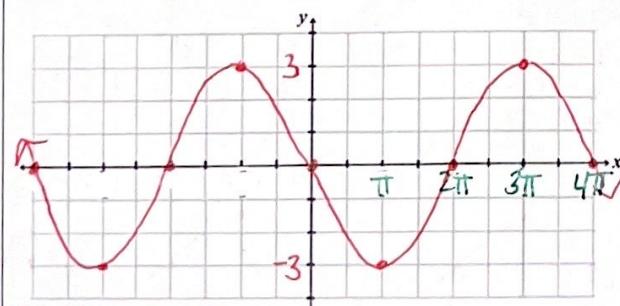
D: $(-\infty, \infty)$
R: $[-1, 1]$

7. $y = 8 \sin\left(\frac{1}{3}x\right)$
 $T = \frac{2\pi}{\frac{1}{3}} = 6\pi$ $\frac{T}{4} = \frac{6\pi}{4} = \frac{3\pi}{2}$
A = 8
y = 0



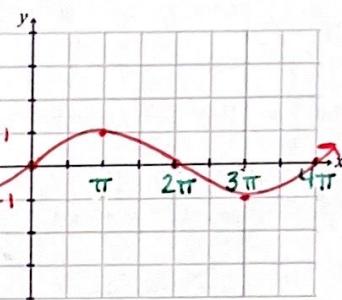
D: $(-\infty, \infty)$
R: $[-8, 8]$

9. $y = -3 \sin\left(\frac{1}{2}x\right)$ $\frac{T}{4} = \pi$
A = 3
y = 0



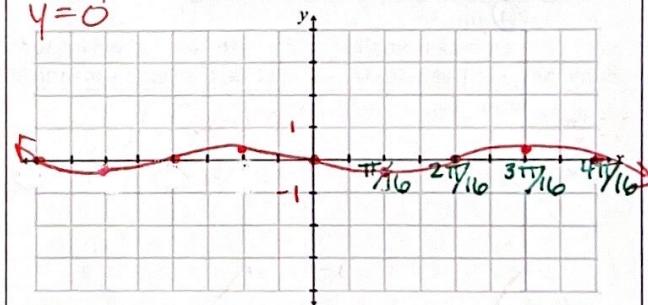
D: $(-\infty, \infty)$
R: $[-3, 3]$

6. $y = \sin\left(\frac{1}{2}x\right)$
 $T = \frac{2\pi}{\frac{1}{2}} = 4\pi$ $\frac{T}{4} = \frac{4\pi}{4} = \pi$
A = 1
y = 0



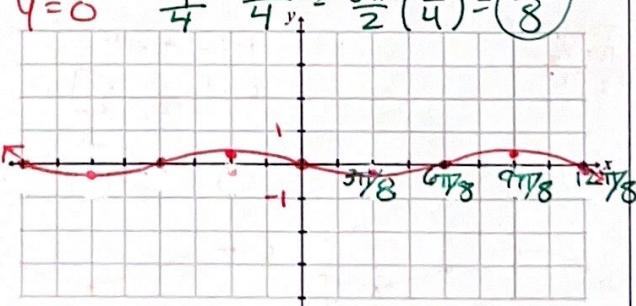
D: $(-\infty, \infty)$
R: $[-1, 1]$

8. $y = -\frac{1}{4} \sin(8x)$
 $T = \frac{2\pi}{8} = \frac{\pi}{4}$ $\frac{T}{4} = \frac{\pi/4}{4} = \frac{\pi}{16}$
A = -1/4
y = 0



D: $(-\infty, \infty)$
R: $[-1/4, 1/4]$

10. $y = -\frac{1}{4} \sin\left(\frac{4}{3}x\right)$
 $T = \frac{2\pi}{4/3} = 2\pi(\frac{3}{4}) = \frac{6\pi}{4} = \frac{3\pi}{2}$
A = -1/4
y = 0



D: $(-\infty, \infty)$
R: $[-1/4, 1/4]$