





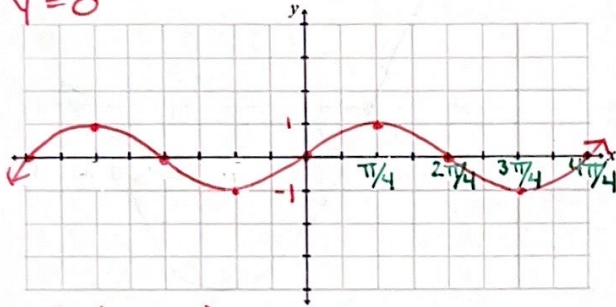
Period Changes (horizontal stretch and shrink):

- $y = A \sin(Bx)$
- 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.  $y = \sin(2x)$

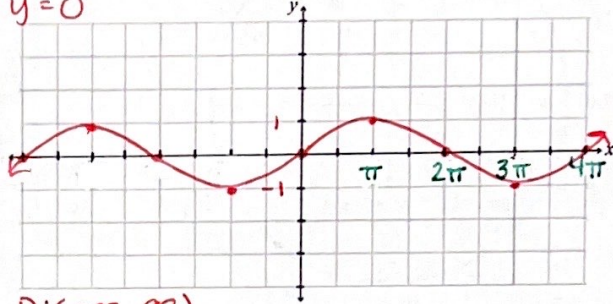
$T = \frac{2\pi}{2} = \pi$      $\frac{T}{4} = \left(\frac{\pi}{4}\right)$   
 $A = 1$   
 $y = 0$



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

6.  $y = \sin\left(\frac{1}{2}x\right)$

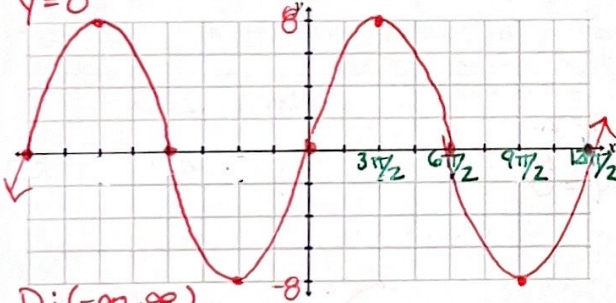
$T = \frac{2\pi}{1/2} = 4\pi$      $\frac{T}{4} = \frac{4\pi}{4} = \pi$   
 $A = 1$   
 $y = 0$



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

7.  $y = 8\sin\left(\frac{1}{3}x\right)$

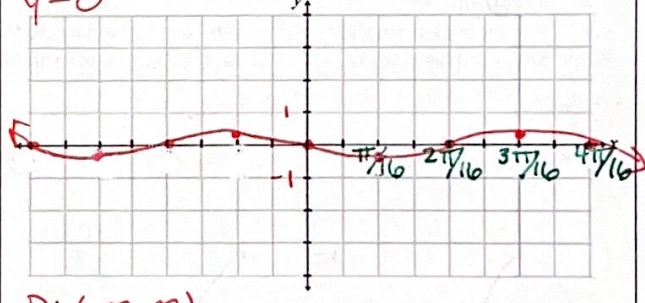
$T = \frac{2\pi}{1/3} = 6\pi$      $\frac{T}{4} = \frac{6\pi}{4} = \frac{3\pi}{2}$   
 $A = 8$   
 $y = 0$



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

8.  $y = -\frac{1}{4}\sin(8x)$

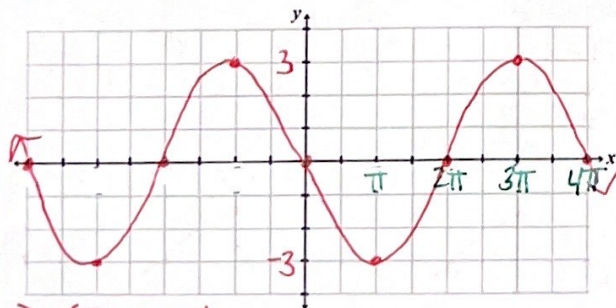
$T = \frac{2\pi}{8} = \frac{\pi}{4}$      $\frac{T}{4} = \frac{\pi/4}{4} = \frac{\pi}{16}$   
 $A = \frac{1}{4}$   
 $y = 0$



D:  $(-\infty, \infty)$   
R:  $[-\frac{1}{4}, \frac{1}{4}]$

9.  $y = -3\sin\left(\frac{1}{2}x\right)$

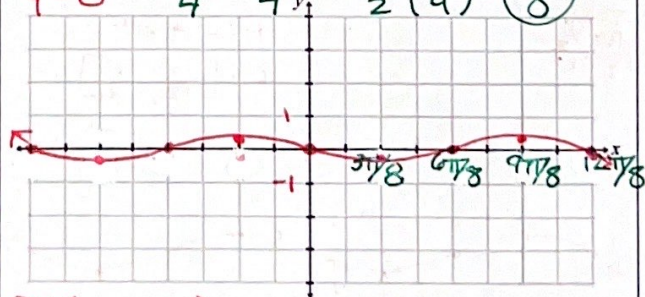
$A = 3$      $\frac{T}{4} = \pi$   
 $y = 0$



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

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

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



D:  $(-\infty, \infty)$   
R:  $[-\frac{1}{4}, \frac{1}{4}]$