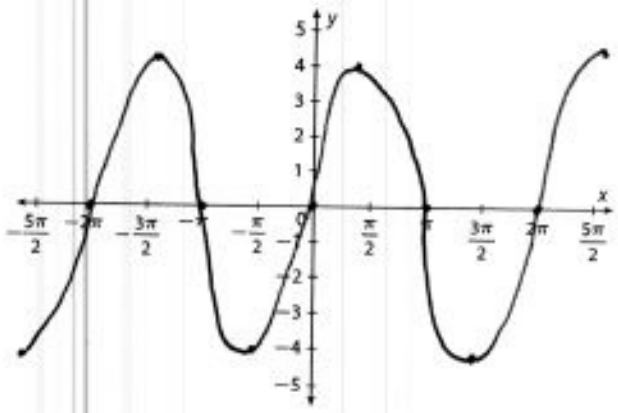
HW 10-5H

Name: Kerry

Graphs of Trig Functions

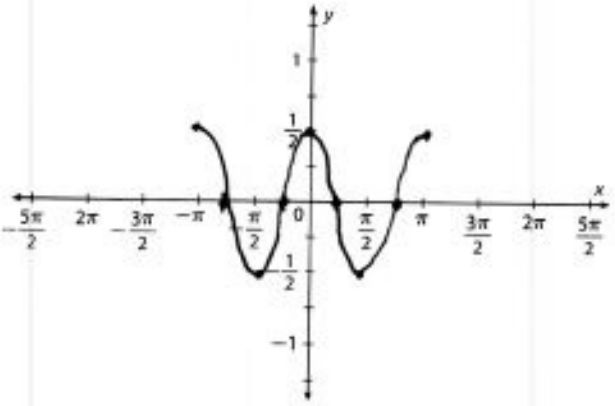
**For each trigonometric function, identify the vertical stretch or compression and the horizontal stretch or compression. Then, graph the function and identify its period.**

**1.** $y = 4 \sin x$ V.S. of 4



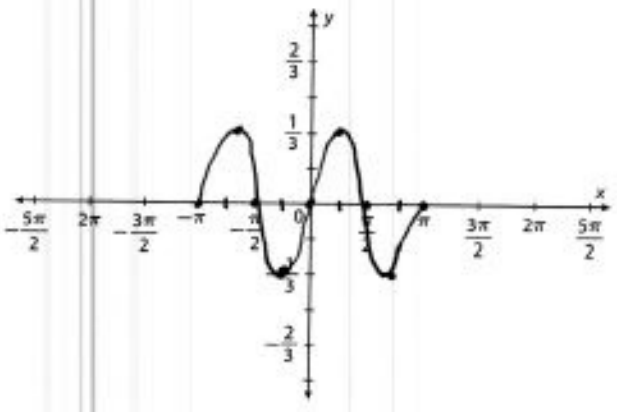
$p = 2\pi$

**2.** $y = \frac{1}{2} \cos 2x$ V. Comp. 1/2, H. ~~Stretch~~ Comp 2



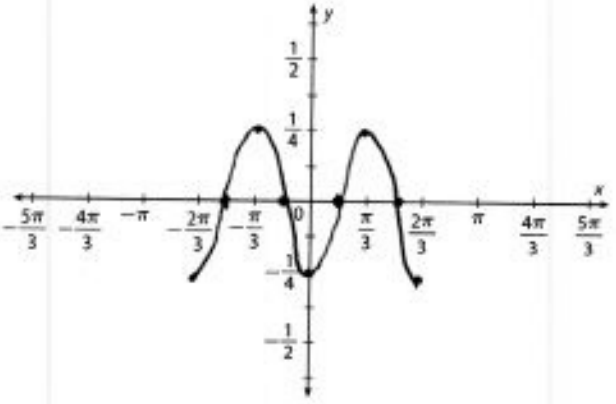
$p = \pi$

**5.** $y = \frac{1}{3} \sin 2x$ V.S. 1/3, H.C 2



$per = \pi$

**6.** $y = -\frac{1}{4} \cos 3x$



$per = \frac{2\pi}{3}$

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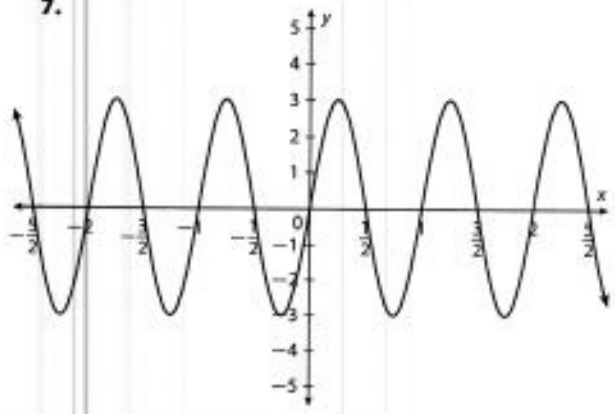
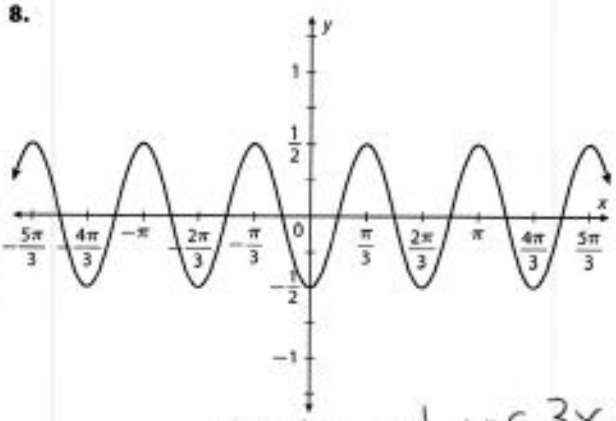
**Write an equation for each graph.**

*7.



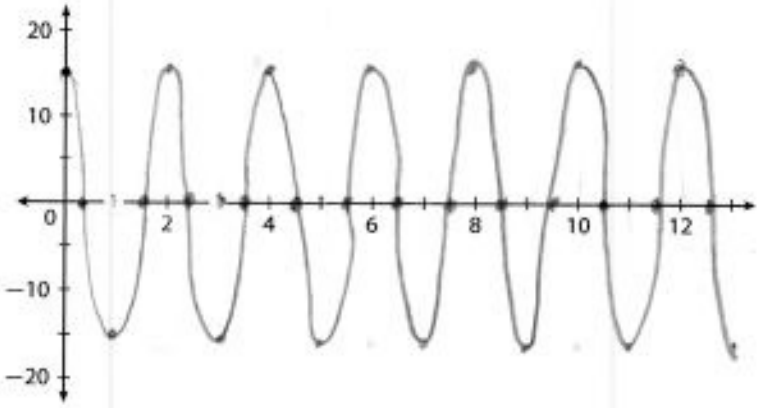
$f(x) = 3 \sin 2\pi x$

8.



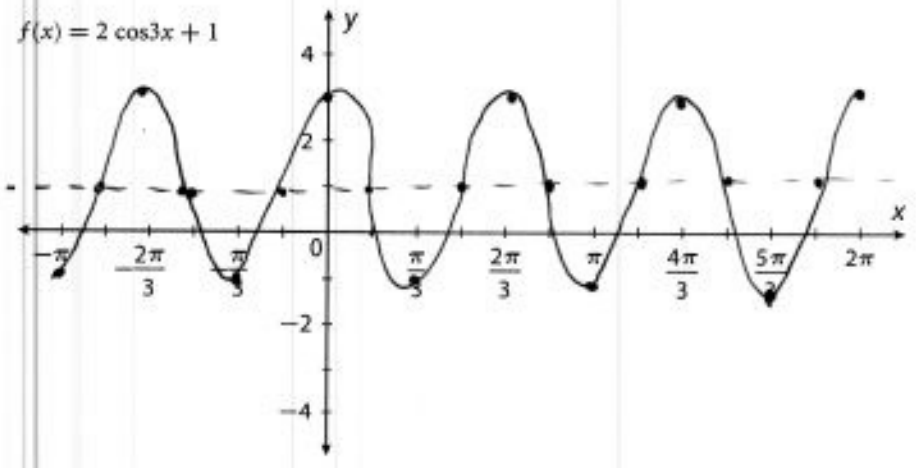
$f(x) = -\frac{1}{2} \cos 3x$

*14. **Physics** A mass attached to a spring oscillates up and down every 2 seconds. Draw a graph of the vertical displacement of the mass relative to its position at rest if the spring is stretched to a length of 15 cm before the mass is released.



**For each function, identify the period and the midline of the graph, and where the graph crosses the midline. For a sine or cosine function, identify the amplitude and the maximum and minimum values and where they occur.**

2. $f(x) = 2\cos 3x + 1$



period: $\frac{2\pi}{3}$ midline → $y = 1$

$a = 2$ max: 3 min: −1

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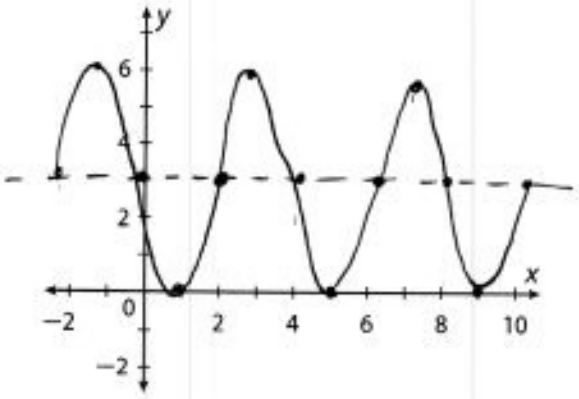
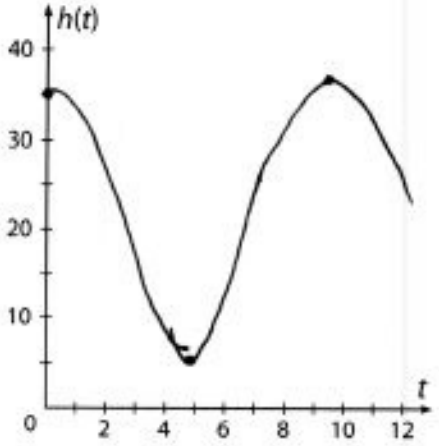
**4.** $f(x) = 3\sin\frac{\pi}{2}(x-2)+3$




$a=3$
$per = 2\pi \cdot \frac{2}{\pi} = 4$
right 2
up 3
midline = 3

**8.** **Historic Technology** Water turns a water wheel at an old mill. The water comes in at the top of the wheel through a wooden chute. The function $h(t) = 15\cos\frac{\pi}{5}t + 20$ models the height $h$ in feet above the stream into which the water empties of a point on the wheel where $t$ is the time in seconds.




**Review**

Find the following values that satisfy the interval of $0 \le \theta \le 2\pi$

1. $\cos\left(\sin^{-1}\frac{\sqrt{3}}{2}\right)$

$\cos(60°)$ or $\cos(120°)$

$-\frac{1}{2}$ or $\frac{1}{2}$

2. $\cot\left(\sec^{-1}\sqrt{2}\right)$

$\cot(45°)$ or $\cot(315°)$

1 or −1

3. $\csc\left(\tan^{-1}0\right)$

$\csc(0)$ or $\csc(180°)$

und or