

Trigonometry Worksheet: Range of Trigonometric Functions (2)

Find the range of each trigonometric function given below

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

$$-1 \leq \sin\left(\frac{\pi x - 2}{2}\right) \leq 1$$

$$1 \geq -\sin\left(\frac{\pi x - 2}{2}\right) \geq -1$$

$$1 - 4 \geq -\sin\left(\frac{\pi x - 2}{2}\right) - 4 \geq -1 - 4$$

range  $[-5, -3]$

2.  $y = -\frac{2}{5}\cos(\pi x - 3) - \frac{1}{5}$

$$-1 \leq \cos(\pi x - 3) \leq 1$$

$$\frac{2}{5} \geq -\frac{2}{5}\cos(\pi x - 3) \geq -\frac{2}{5}$$

$$\frac{2}{5} - \frac{1}{5} \geq -\frac{2}{5}\cos(\pi x - 3) - \frac{1}{5} \geq -\frac{2}{5} - \frac{1}{5}$$

3.  $y = -0.4\sin(0.1x - 0.2) - 0.7$

range:  $\left[-\frac{3}{5}, \frac{1}{5}\right]$

$$-1 \leq \sin(0.1x - 0.2) \leq 1$$

$$0.4 \geq -0.4\sin(0.1x - 0.2) \geq -0.4$$

$$0.4 - 0.7 \geq -0.4\sin(0.1x - 0.2) - 0.7 \geq -0.4 - 0.7$$

range:  $[-1.1, -0.3]$