Trig   6.4

Find the amplitude and period for sine and cosine functions
Write equations of sine and cosine functions given the amplitude and
period

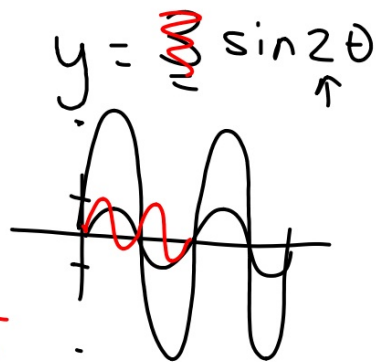parent graph

amplitude

$$y = \frac{3}{2} \sin 2\theta \qquad \frac{2\pi}{2} = \pi$$

period

frequency

hertz $\frac{1 \text{ cycle}}{\text{sec.}}$

tuning forks

Write an equation of the sine function with each amplitude and period.

12. amplitude = 0.8, period = π　　　**13.** amplitude = 7, period = $\frac{\pi}{3}$

$$\frac{1}{3}\pi$$

$$y = 0.8 \sin(2)\theta$$

$$\frac{2\pi}{n} = \frac{\frac{1}{3}\pi}{1}$$

$$\frac{2\pi}{k} = \frac{\pi}{1}$$

$$2\pi = \frac{1}{3}\pi n$$

$$\frac{\pi \cdot k}{\pi} = \frac{2\pi}{\pi}$$

$$\frac{2\pi}{\frac{1}{3}\pi} = \frac{\frac{1}{3}\pi n}{\frac{1}{3}\pi}$$

Write an equation of the cosine function with each amplitude and period.

14. amplitude $= 1.5$, period $= 5\pi$ **15.** amplitude $= \dfrac{3}{4}$, period $= 6$

$$y = 1.5 \cos \dfrac{2}{5}\theta$$

$$\dfrac{2\pi}{k} = \dfrac{5\pi}{1}$$

$$\dfrac{5\pi k}{5\pi} = \dfrac{2\pi}{5\pi}$$

$$y = \dfrac{3}{4} \cos \dfrac{1}{3}\pi\theta$$

$$\dfrac{2\pi}{k} = 6$$

$$\dfrac{6k}{6} = \dfrac{2\pi}{6}$$

$$\text{per} \quad 3\frac{car}{hr}$$

I can wash 3 cars per hour.
How long does it take to wash 1 car?

per 2

I can walk 4 miles per hour.
How long does it take to walk one mile?

$$f$$

$$\left(\frac{1}{3}\right)\frac{hr}{car} \qquad 20\,min$$

$$4\frac{mi}{hr.}$$

$$f$$

$$\frac{1}{4}\frac{hr}{mi}$$

$$\text{per} = \frac{1}{f}$$

$$f = \frac{1}{per}$$

frequency: "How many in a unit of time?"
period: "How long does it take for one?"

P= Length for one cycle
period

F=number of cycles per time

$$period = \frac{1}{frequency}$$ $$frequency = \frac{1}{period}$$

$$1 \text{ hertz} = \frac{1 \text{ cycle}}{sec}$$

1 hertz = 1 cycle per second

(radians)

16. Music Write a sine equation that represents the initial behavior of the vibrations of the note D above middle C having an amplitude of 0.25 and a frequency of 294 hertz.

$$y = 0.25 \sin 588\pi\, \theta$$

$$f = 294 \frac{cy}{sec}$$

$$\frac{2\pi}{n} = \frac{1}{294}$$

$$n =$$

$$P = \frac{1}{294} \frac{sec}{cycle}$$