

Identify the transformations and graph each equation.

$$f(x) = -6\cos 5x + 8$$

Amp: 6

MS: 8

Per: $\frac{2\pi}{5}$

PS: 0

Reflection: Yes

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

Amp: 9

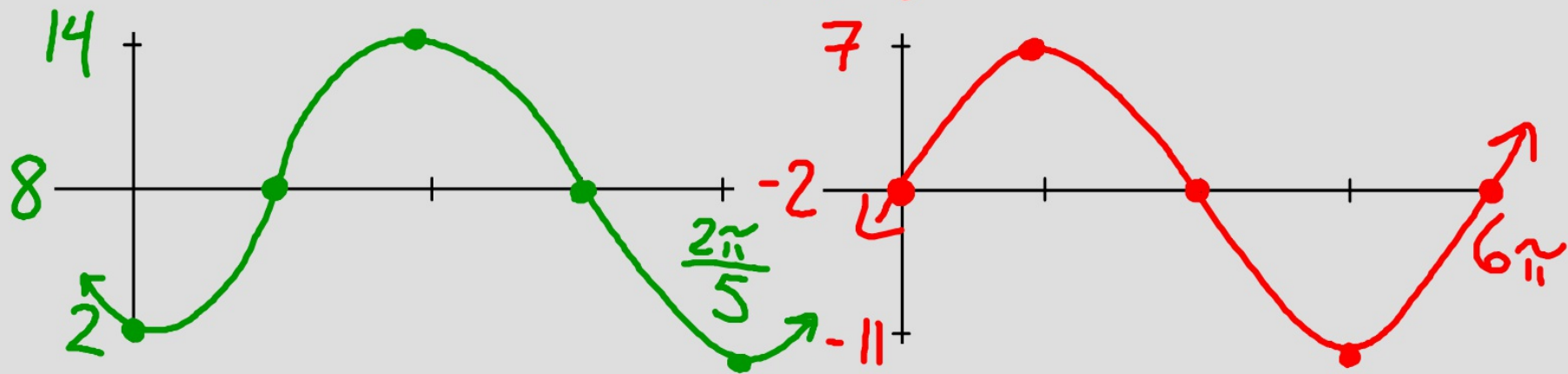
MS: -2

Per: 6π

PS: 0

Reflection: No

$\frac{2\pi}{b}$ ←
 $b = \frac{1}{3}$
 $2 / (1/3)$



Identify the transformations.

$$f(x) = \overset{a}{\cos}(\overset{b}{2}\overset{c}{x} + \overset{d}{6}) + 1$$

Amp: 1

MS: 1

Per: π

PS: -3

Reflection: No

$$\rightarrow \frac{-c}{b} = \frac{-6}{2}$$

$$f(x) = \overset{a}{7}\overset{b}{\sin}(\overset{c}{x}/3 - 4)$$

Amp: 7

MS: 0

Per: 6π

PS: 12

Reflection: No

$$\rightarrow \frac{-c}{b} = \frac{4}{(1/3)} = 12$$

$$\rightarrow \frac{2\pi}{b} \rightarrow \frac{2\pi}{1/3} \rightarrow 2/(1/3) = 6$$

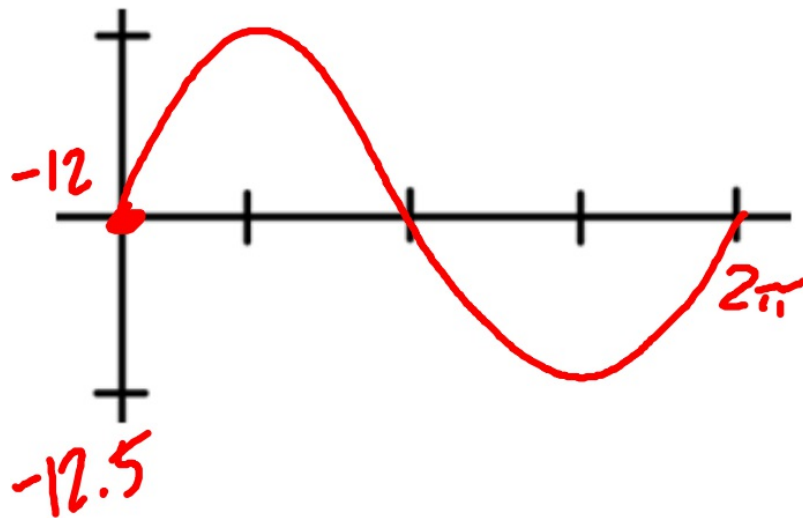
1) $y = 1/2 \sin x - 12$

Amplitude: $\frac{1}{2}$

Period: 2π

Phase Shift: 0

Vertical Shift: -12



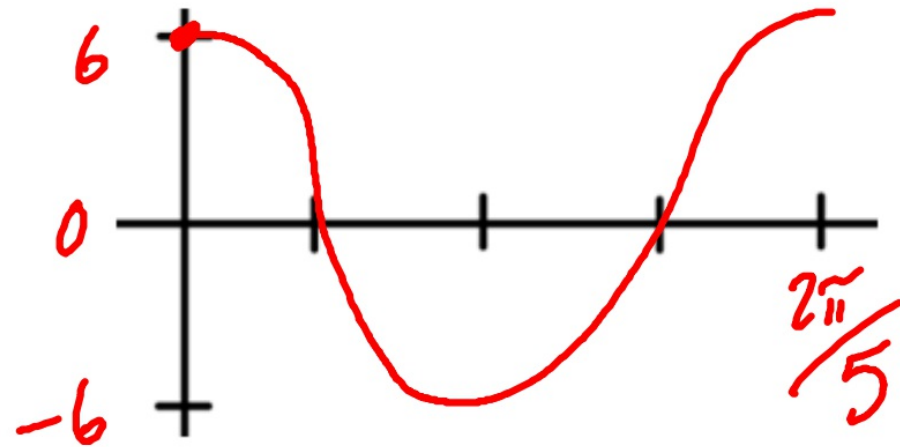
2) $y = 6 \cos 5x$

Amplitude: 6

Period: $2\pi/5$

Phase Shift: 0

Vertical Shift: 0



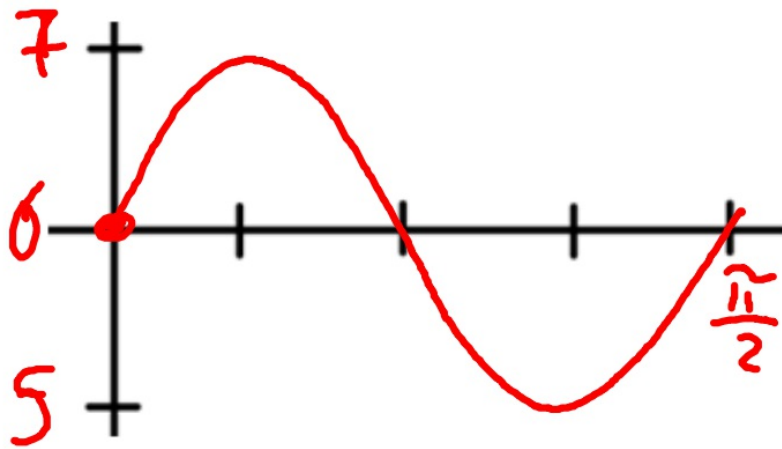
3) $y = \sin 4x + 6$ $\frac{2\pi}{b}$ $\frac{2\pi}{4}$

Amplitude: 1

Period: $\frac{\pi}{2} = \frac{1}{2}\pi$

Phase Shift: 0

Vertical Shift: 6



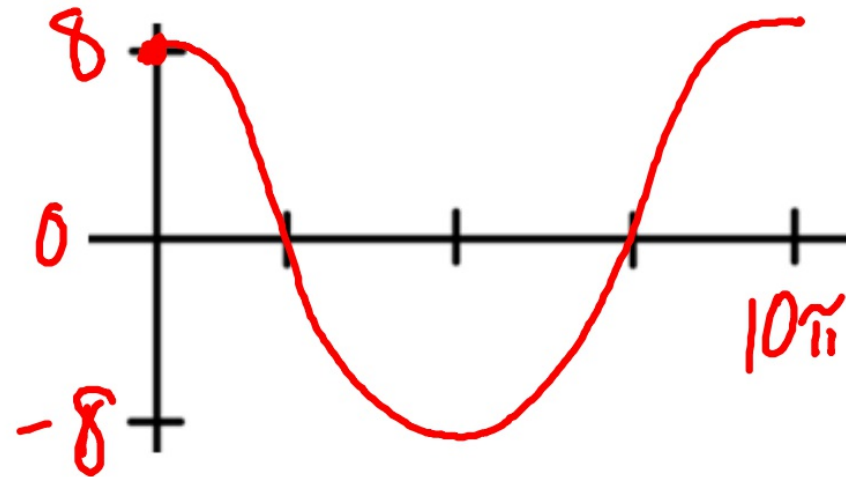
4) $y = 8 \cos \frac{1}{5}x$ b $\frac{2\pi}{1/5}$

Amplitude: 8

Period: 10π

Phase Shift: 0

Vertical Shift: 0



$$b=1 \quad c = \frac{-\pi}{4}$$

$$14) y = 3\sin(x - \frac{\pi}{4})$$

Amplitude: 3

Period: 2π

Phase Shift: $\frac{\pi}{4}$

Vertical Shift: 0

$\frac{-c}{b} = \frac{\frac{\pi}{4}}{1}$

$\frac{-\frac{\pi}{2}}{(\frac{1}{3})}$

$(-1/2)/(1/3) = -\frac{3}{2}$

$$b \quad c$$

$$15) y = \cos(\frac{x}{3} + \frac{\pi}{2})$$

Amplitude: 1

Period: 6π

Phase Shift: $-\frac{3\pi}{2}$

Vertical Shift: 0

$\frac{2\pi}{b} \rightarrow \frac{2\pi}{1/3} \rightarrow 2/(1/3)$

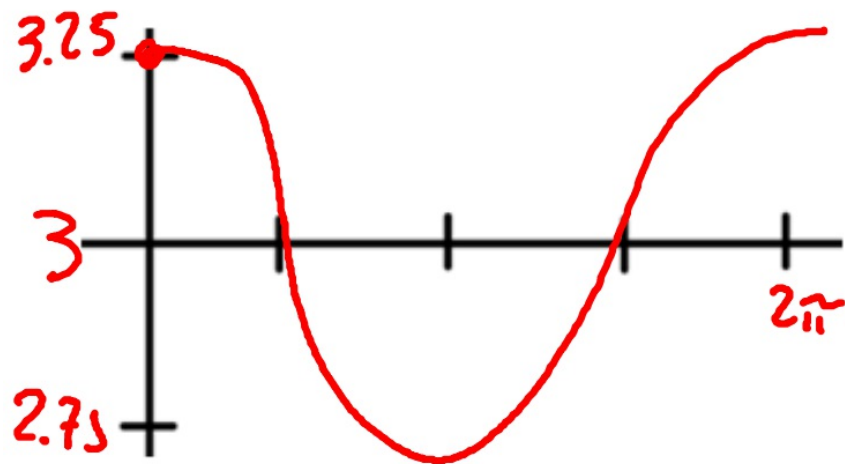
16) $y = \frac{1}{4} \cos x + 3$

Amplitude: $\frac{1}{4}$

Period: 2π

Phase Shift: 0

Vertical Shift: 3



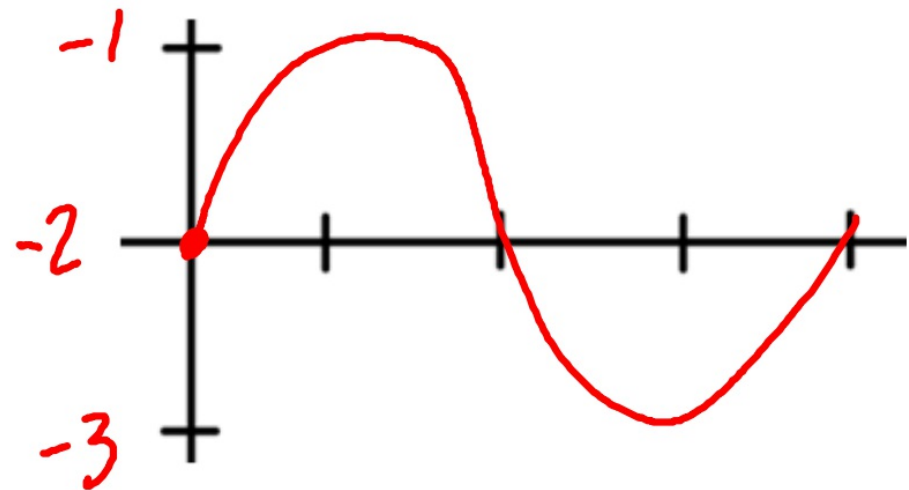
17) $y = \sin 3x - 2$

Amplitude: 1

Period: $\frac{2\pi}{3}$

Phase Shift: 0

Vertical Shift: -2



Unit 4: Trig. Part II

Sinusoidal Functions

Right Triangle Trig.

Law of Sine

Law of Cosine

Amplitude

Vertical Shift

Quiz...

**Now For
Word
Problems**

Common Questions

-- Ferris Wheel

Diameter / Radius = Amp

Axle Height = Midline

Rotation Time = Period

-- Daylight, Tides and Temperature

High & Low \longrightarrow $Avg = \frac{H+L}{2} = \text{Midline}$

Cycle Time

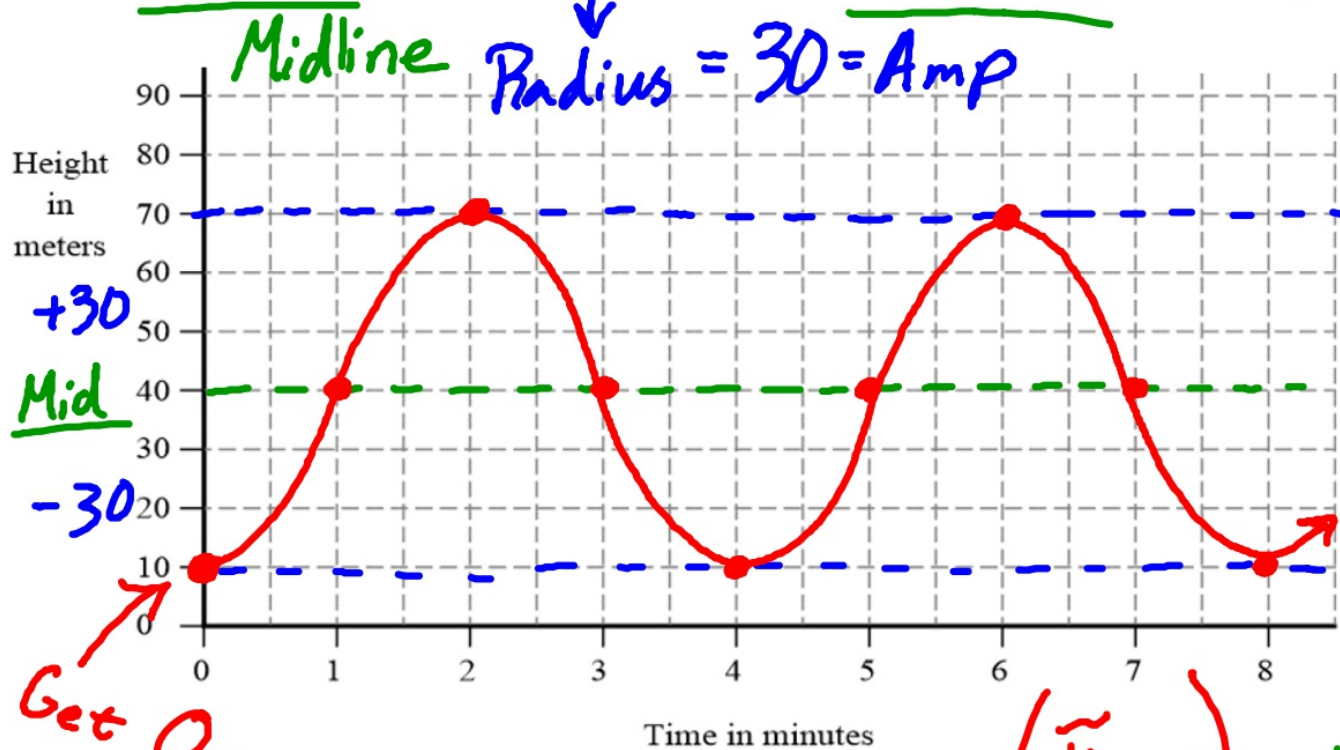
\hookrightarrow Period

$\text{High} - \text{Mid} = \text{Amp}$

(Daylight & Temp \rightarrow Per = 1 year)

A Ferris wheel is 60 meters in diameter and rotates once every four minutes.

The center axle of the Ferris wheel is 40 meters from the ground.



$$\text{Per} = \frac{2\pi}{b}$$

$$b = \frac{2\pi}{\text{Per}}$$

$$y = -\underset{\text{Radius}}{30} \cos\left(\frac{2\pi}{4} x\right) + \underset{\text{Axle}}{40}$$

Ex1) A ferris wheel's axle is 30 feet off the ground, has a radius of 25 feet and takes 6 min to rotate. Write an equation to match.

$$y = -25 \cos\left(\frac{2\pi x}{6}\right) + 30$$

Radius $\frac{2\pi}{6}$ \curvearrowright Axle

Ex2) The annual high temperature in Charlotte is about 105° and the low is 15°. Write an equation to model that starts in the spring.

$$y = 45 \sin(2\pi x) + 60$$

$\frac{105+15}{2}$
105-60 (spring) Per = 1yr