

PreCalculus

Name: _____ Per: _____

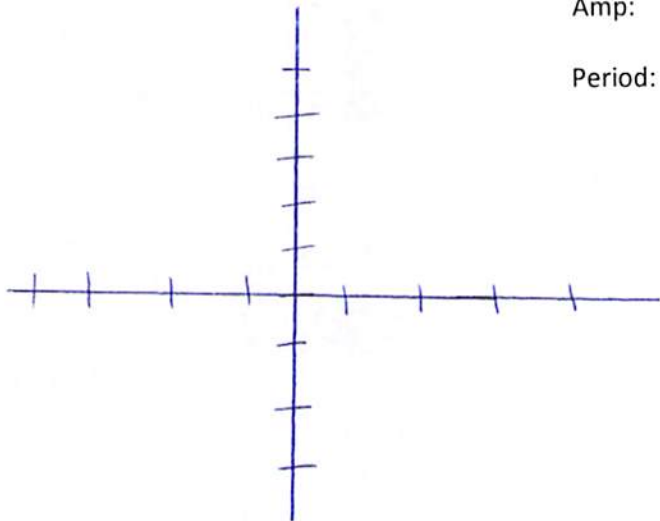
4.4. Graphs of Sine and Cosine

Identify the amplitude and period. Then sketch one period of the graph.

1. $f(x) = \sin x + 2$

Amp:

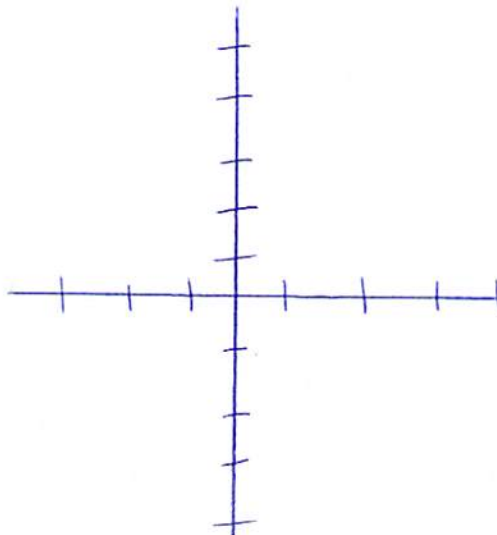
Period:



2. $f(x) = \sin x - 2$

Amp:

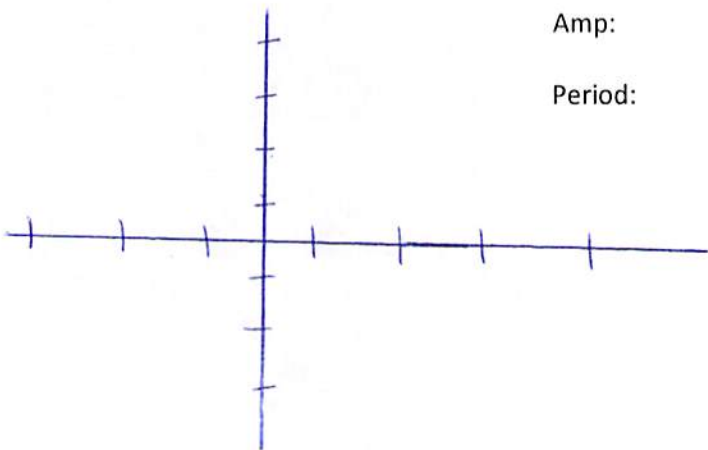
Period:



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

Amp:

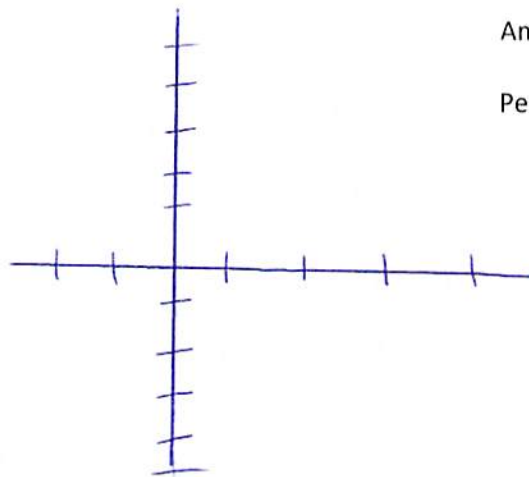
Period:



4. $f(x) = \cos x - 3$

Amp:

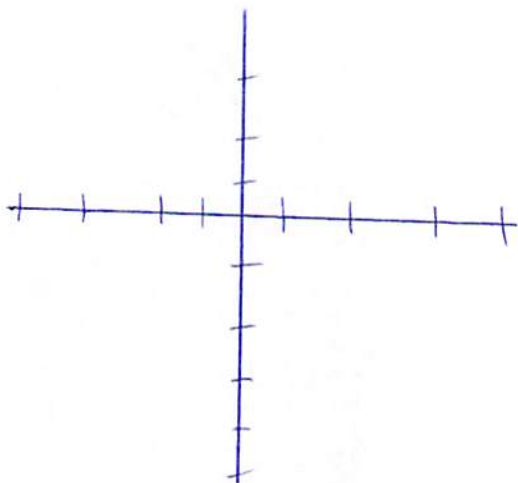
Period:



5. $f(x) = 2 \sin\left(\frac{1}{2}x\right) + 1$

Amp:

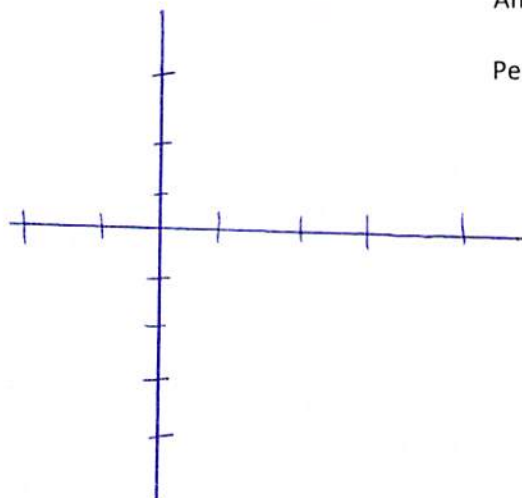
Period:



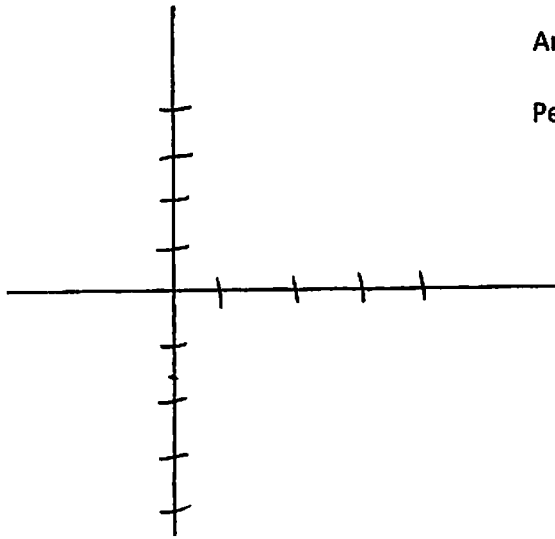
6. $f(x) = 2 \cos\left(\frac{1}{2}x\right) - 1$

Amp:

Period:

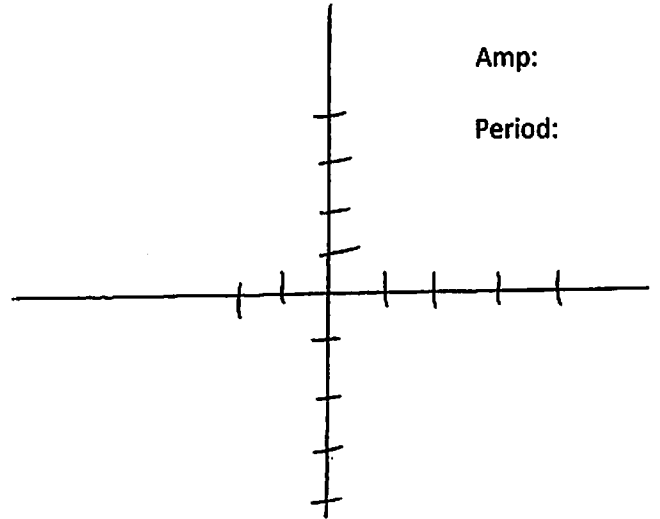


7. $f(x) = -\sin(\pi x)$



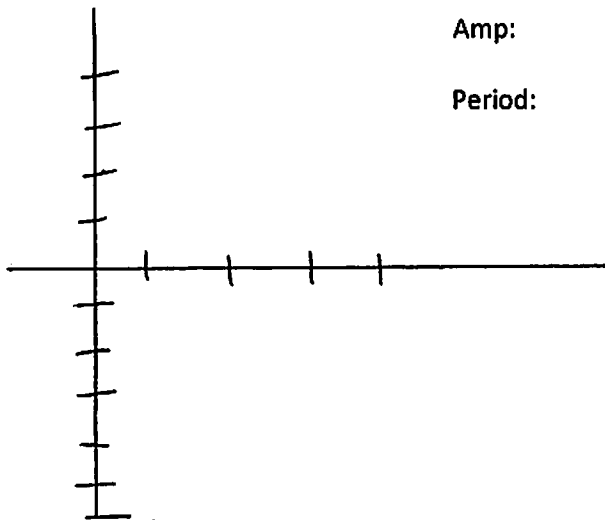
Amp:
Period:

8. $f(x) = -3\cos(2\pi x)$



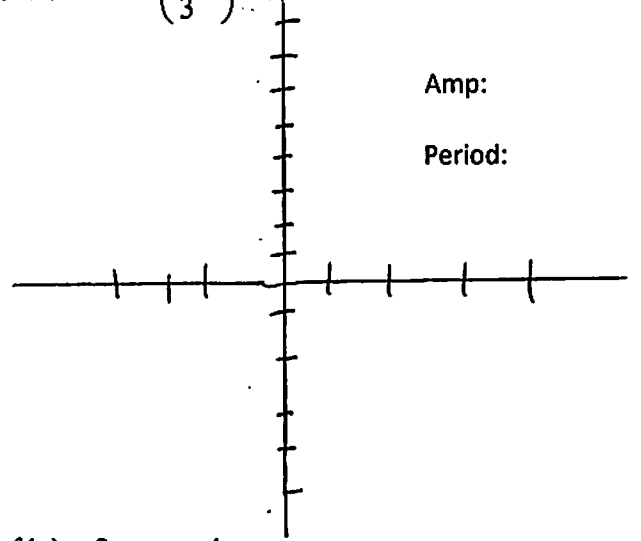
Amp:
Period:

9. $f(x) = 4\sin(2x) - 2$



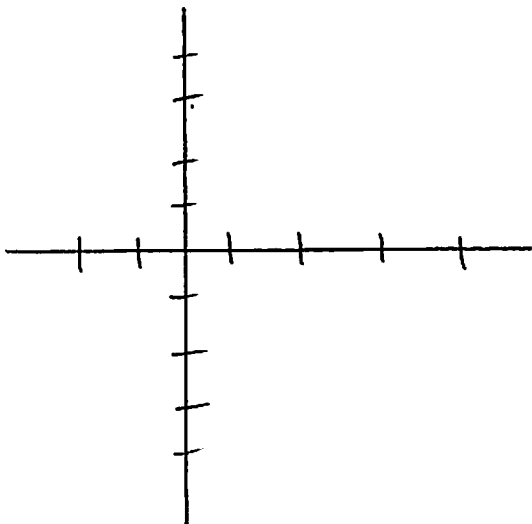
Amp:
Period:

10. $f(x) = 4\cos\left(\frac{2}{3}x\right) + 3$



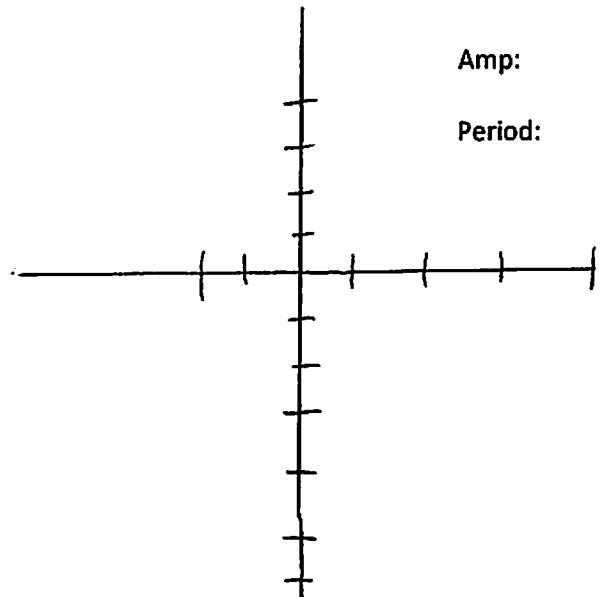
Amp:
Period:

11. $f(x) = -\frac{1}{2}\sin x + 3$



Amp:
Period:

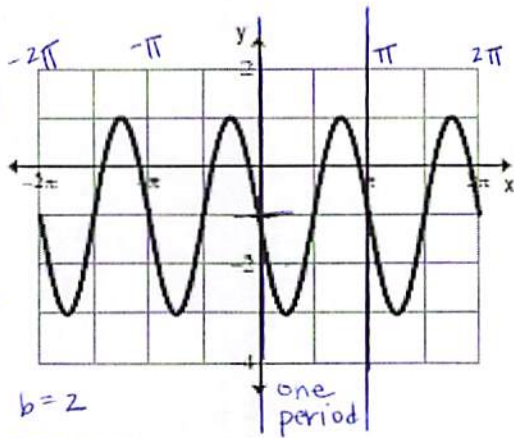
12. $f(x) = 2\cos x - 4$



Amp:
Period:

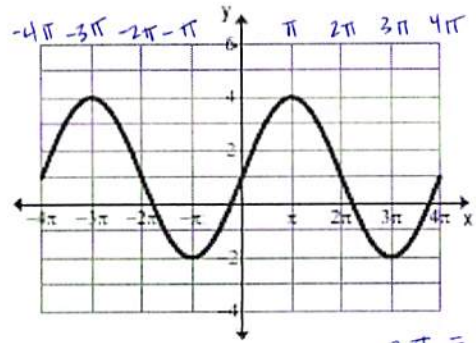
Identify the amplitude, period, and midline. Then write the equation for the function.

13.



$\frac{2\pi}{b} = \text{one period}$
 $\frac{2\pi}{b} = \pi$
 Solve for b
 $2\pi = b\pi$
 $\frac{2\pi}{\pi} = \frac{b\pi}{\pi}$ $b=2$
 Amp: $b=2$
 Period: π $b=2$
 Midline:
 Equation:

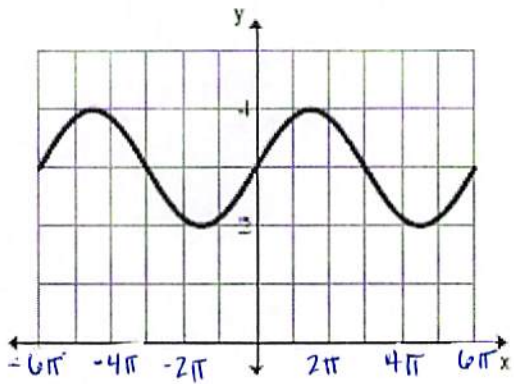
14.



$\frac{2\pi}{b} = \text{one period}$

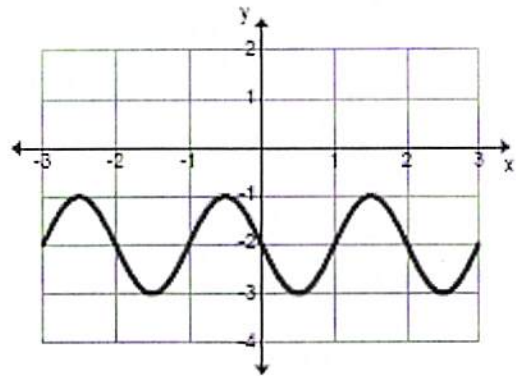
Amp:
 Period:
 Midline:
 Equation:

15.



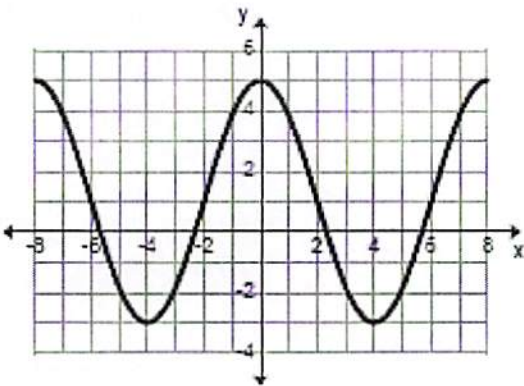
Amp:
 Period:
 Midline:
 Equation:

16.



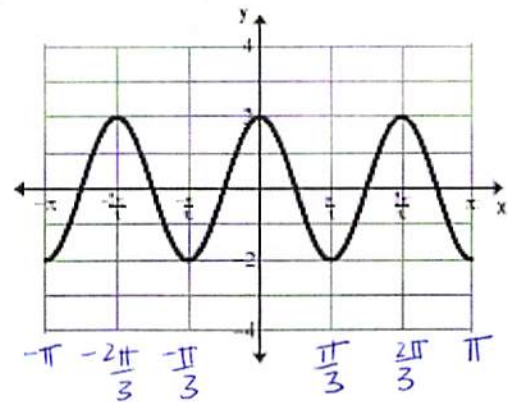
Amp:
 Period:
 Midline:
 Equation:

17.



Amp:
 Period:
 Midline:
 Equation:

18.

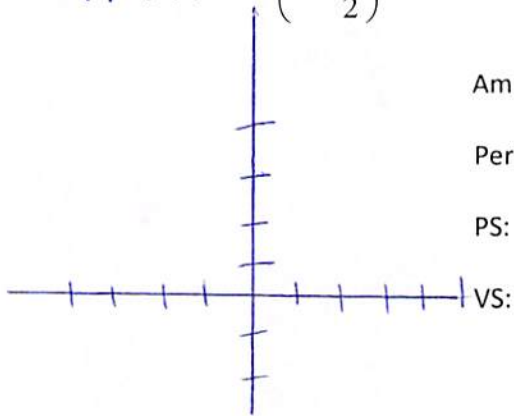


Amp:
 Period:
 Midline:
 Equation:

Graphing Sine and Cosine – Phase Shift

Identify the amplitude, period, phase shift, and vertical shift, then sketch one period of the graph.

19 $f(x) = \sin\left(x - \frac{\pi}{2}\right) + 2$



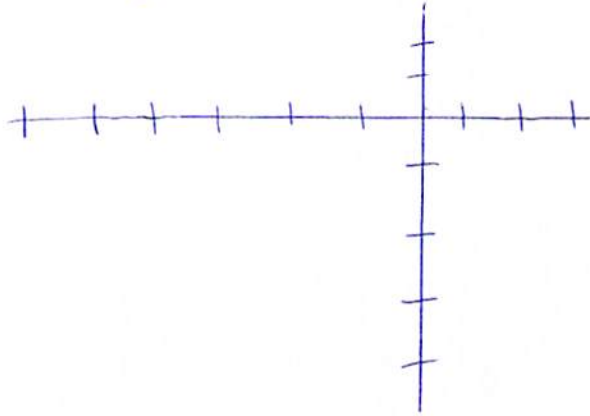
Amp:

Period:

PS:

VS:

20 $f(x) = \cos(x + \pi) - 1$



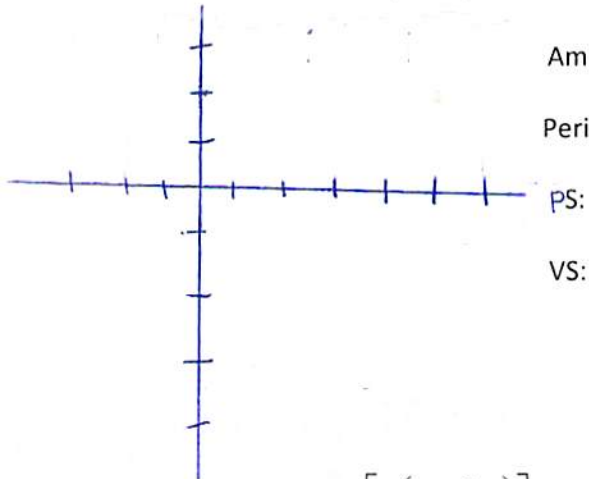
Amp:

Period:

PS:

VS:

21 $f(x) = -2\sin(x - \pi)$



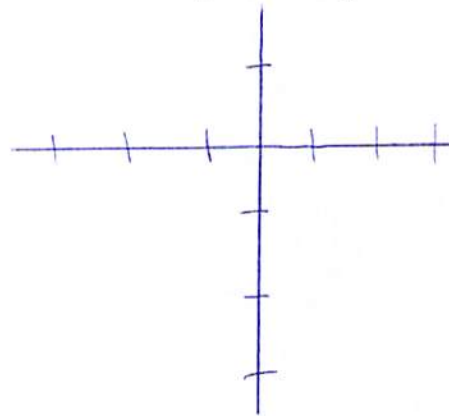
Amp:

Period:

PS:

VS:

22 $f(x) = -\cos\left[\frac{1}{2}\left(x + \frac{\pi}{2}\right)\right]$



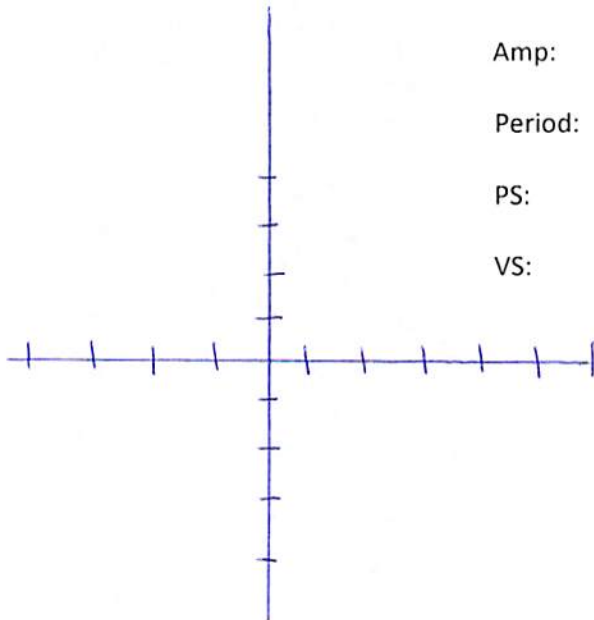
Amp:

Period:

PS:

VS:

23 $f(x) = 3\sin\left[2\left(x - \frac{3\pi}{2}\right)\right]$



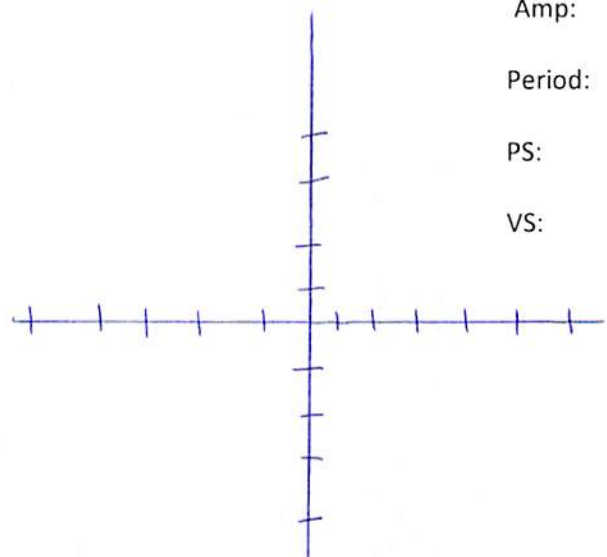
Amp:

Period:

PS:

VS:

24 $f(x) = \cos\left[3\left(x + \frac{3\pi}{2}\right)\right] + 1$



Amp:

Period:

PS:

VS:

- 25 A buoy oscillates up and down as waves go past. The buoy moves a total of 3.6 feet from its low point to its high point, and then returns to its high point every 8 seconds. Write a cosine function modeling the buoy's vertical position at any time t .
- 26 A Ferris wheel 50 feet in diameter makes one revolution every 40 seconds. The center of the wheel is 30 feet above the ground. Write a cosine function to model the height of a car on the Ferris wheel at any time t .
- 27 Low tide is at 10:15 am and high tide is at 4:15 pm. The water level varies 64 inches between low and high tide. Write a cosine function to represent the change in water level.
- 28 The lowest pitch a human can easily hear has a frequency of 30 cycles per second. Write a sine function representing the sound wave of the pitch. (Amplitude is 1)
- 29 The highest pitch a human can easily hear has a frequency of 20,000 cycles per second. Write a sine function representing the sound wave of the pitch. (Amplitude is 1)
- 30 In Buenos Aires, Argentina, the average monthly temperature is the highest in January and the lowest in July. It ranges from $76^{\circ}F$ to $51^{\circ}F$. Write a cosine function that models the change in temperature according to the month of the year.