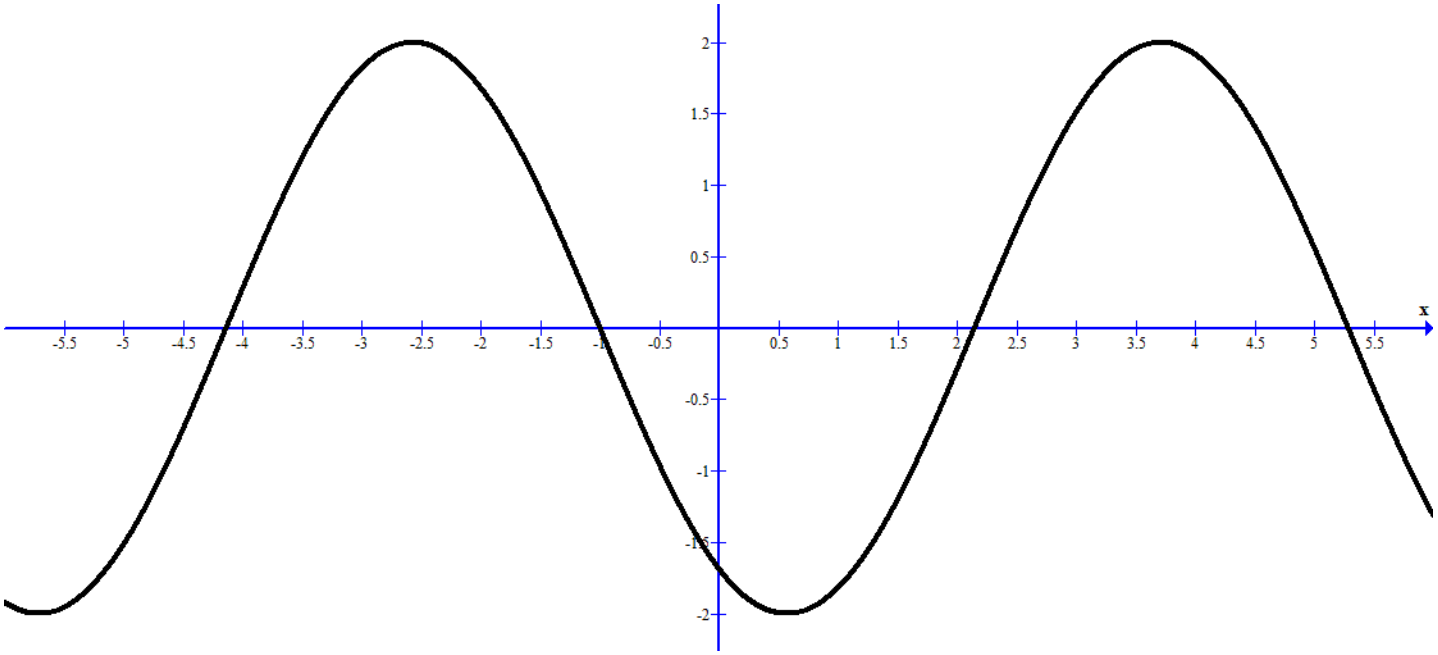
Graphing Exercise

1. For the given function $f$, find its amplitude and period, and graph the function. On your graph, for at least one cycle, indicate the $x-$coordinate of where the the maximum and minimum value(s) occurs, and where the function intercepts its neutral position.

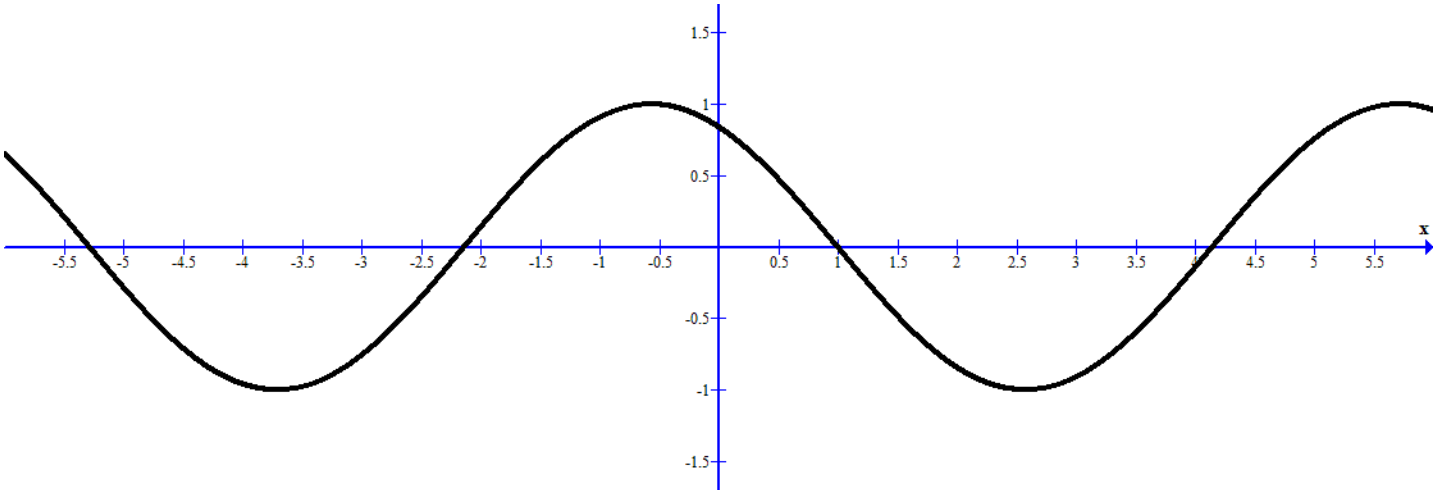
a. $f(x) = -2\sin(x+1)$.

Ans: Start Point: $x = -1$; amplitude $= 2$; period $= 2\pi$; End Point: $x = -1+2\pi$; neutral position at $x = -1+\pi$; min at $x = -1+\frac{\pi}{2}$; max at $x = -1+\frac{3\pi}{2}$;



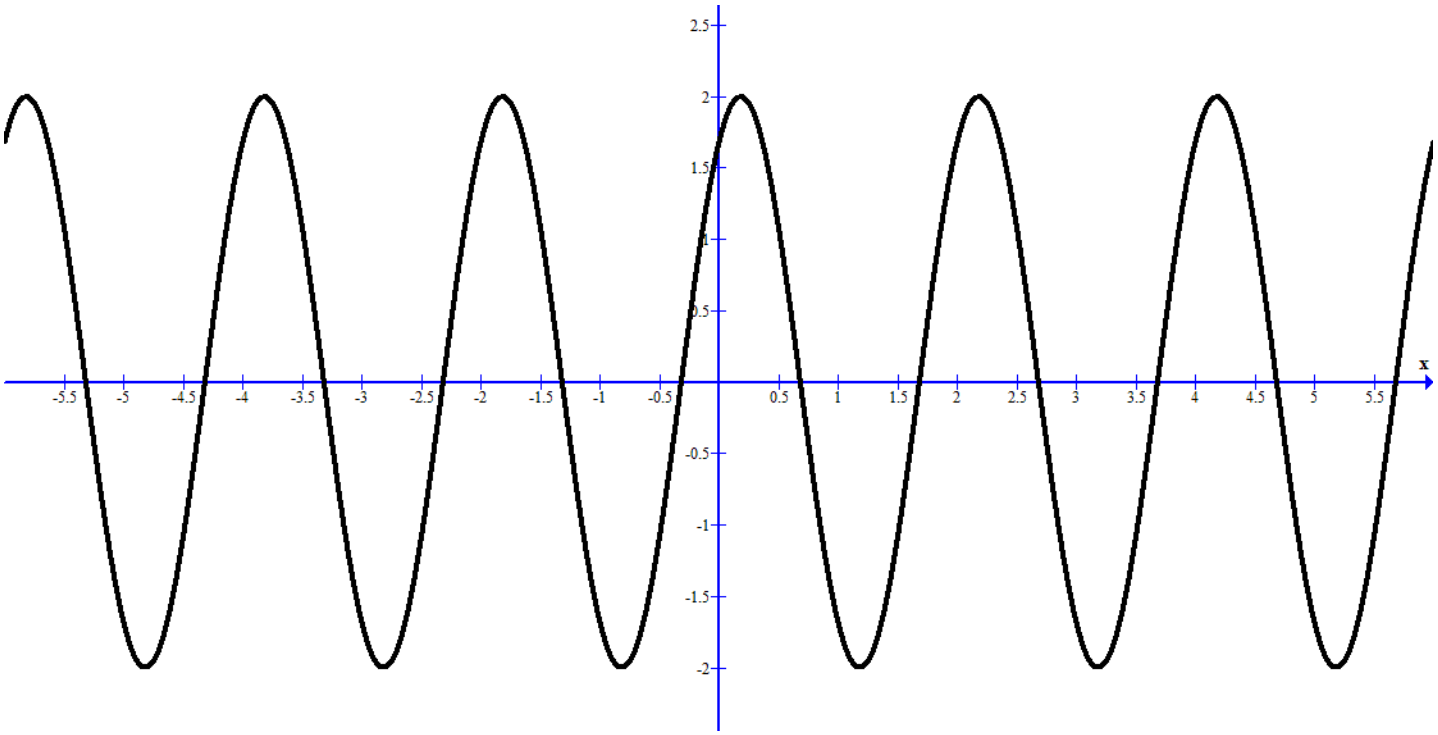

b. $f(x) = \sin(-x+1)$.

Ans: Start Point: $x = 1$; amplitude $= 1$; period $= 2\pi$; End Point: $x = 1+2\pi$; neutral position at $x = 1+\pi$; min at $x = 1+\frac{\pi}{2}$; max at $x = 1+\frac{3\pi}{2}$;



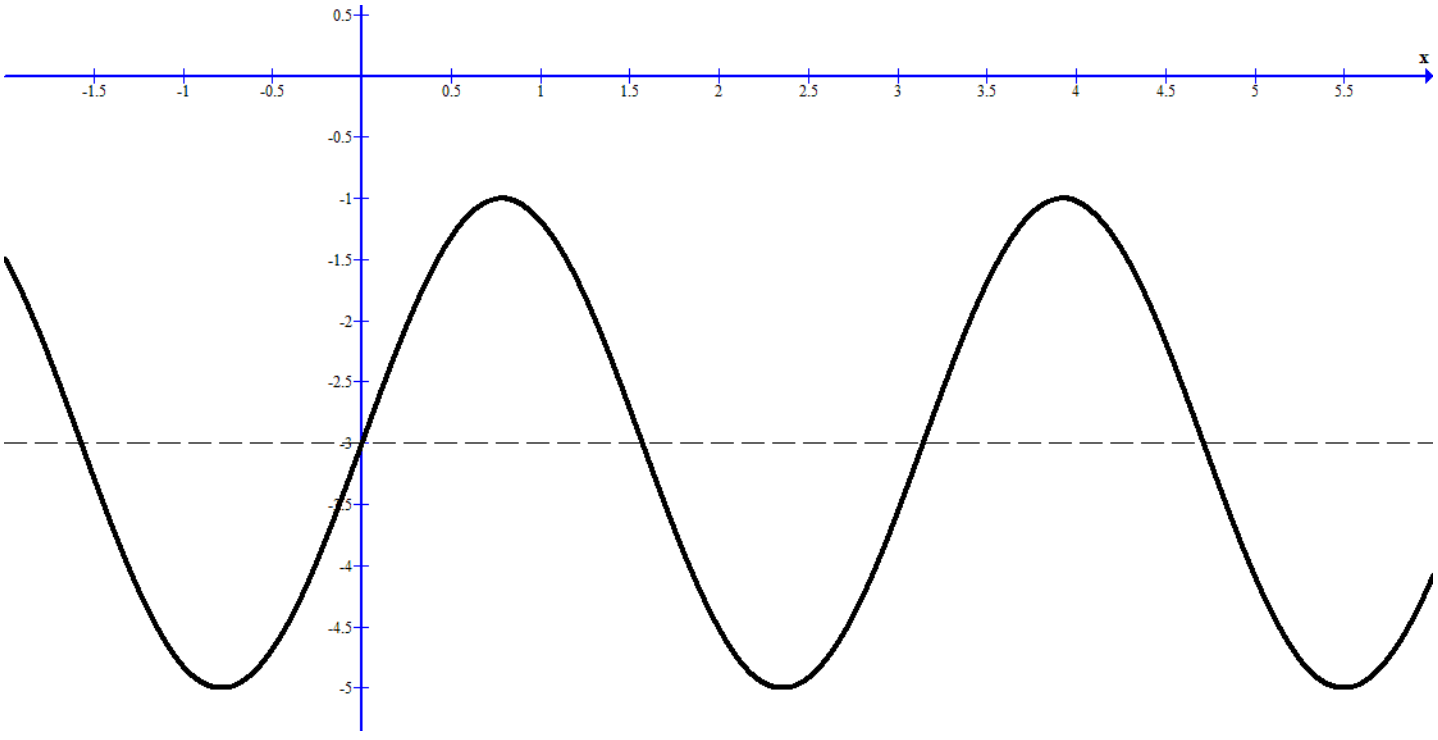
c. $f(x) = 2\sin(\pi x + 1)$.

Ans: Start Point: $x = -\dfrac{1}{\pi}$; amplitude $= 2$; period $= 2$; End Point: $x = -\dfrac{1}{\pi} + 2$;
neutral position at $x = -\dfrac{1}{\pi} + 1$; min at $x = -\dfrac{1}{\pi} + \dfrac{3}{2}$; max at $x = -\dfrac{1}{\pi} + \dfrac{1}{2}$;



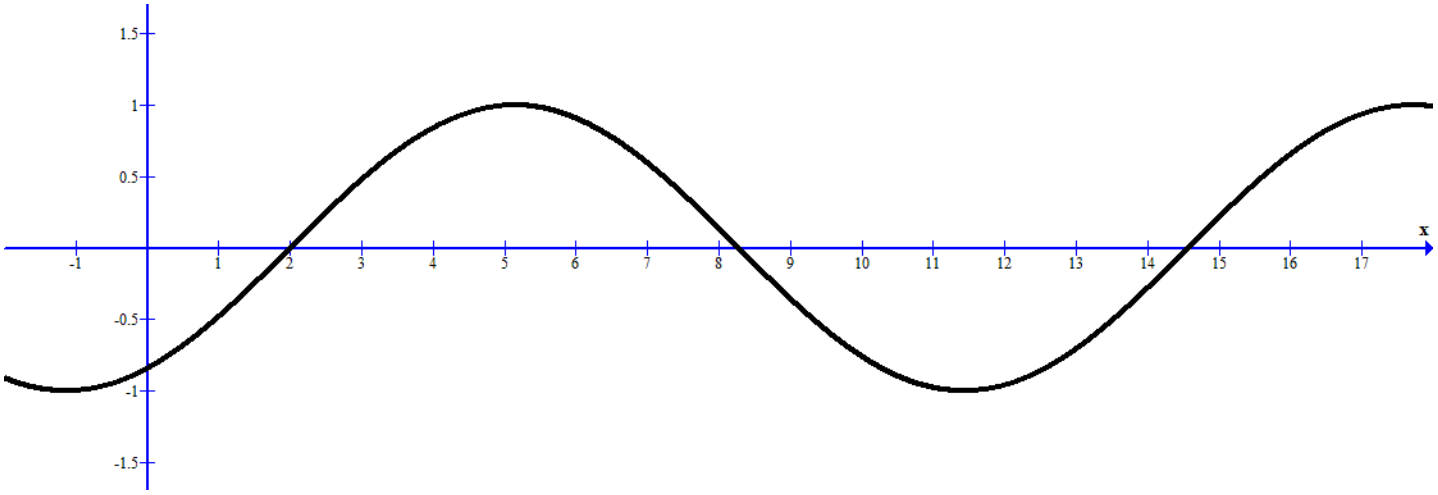

d. $f(x) = -2\sin(2x - \pi) - 3$.

Ans: Start Point: $x = \dfrac{\pi}{2}$; amplitude $= 2$; period $= \pi$; End Point: $x = \dfrac{\pi}{2} + \pi = \dfrac{3\pi}{2}$;
neutral position at $x = \dfrac{\pi}{2} + \dfrac{\pi}{2} = \pi$; min at $x = \dfrac{\pi}{2} + \dfrac{\pi}{4} = \dfrac{3\pi}{4}$; max at $x = \dfrac{5\pi}{4}$;



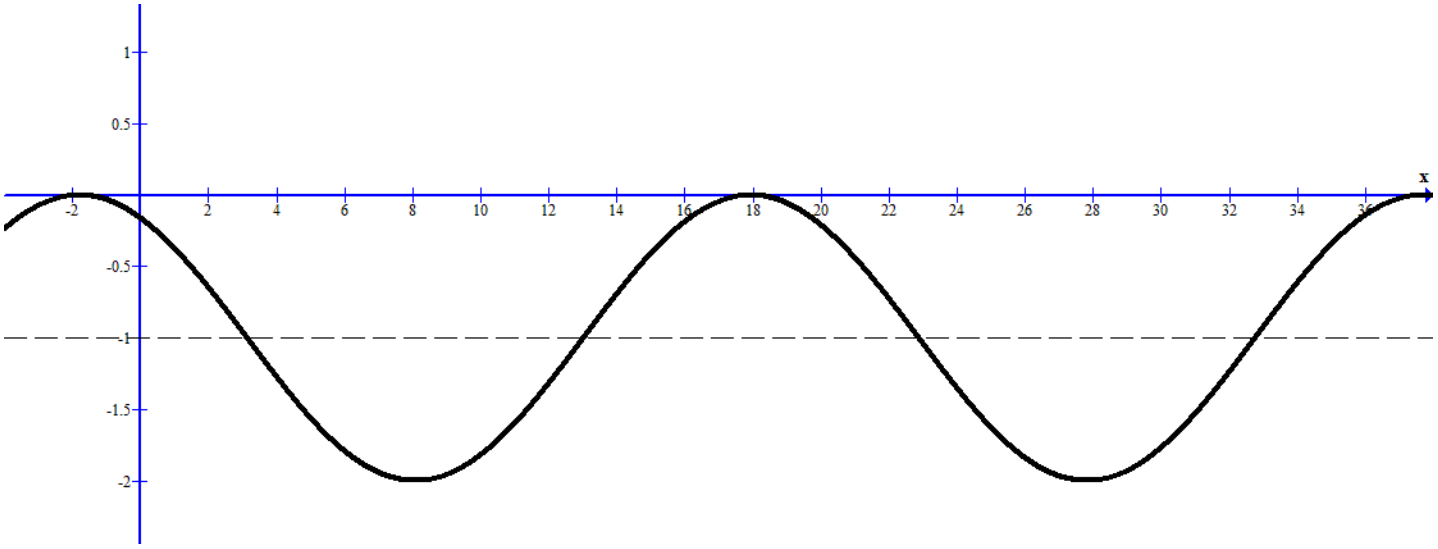
e. $f(x) = \sin\left(\frac{x}{2} - 1\right)$.

Ans: Start Point: $x = 2$; amplitude $= 1$; period $= 4\pi$; End Point: $x = 2 + 4\pi$; neutral position at $x = 2 + 2\pi$; min at $x = 2 + 3\pi$; max at $x = 2 + \pi$;



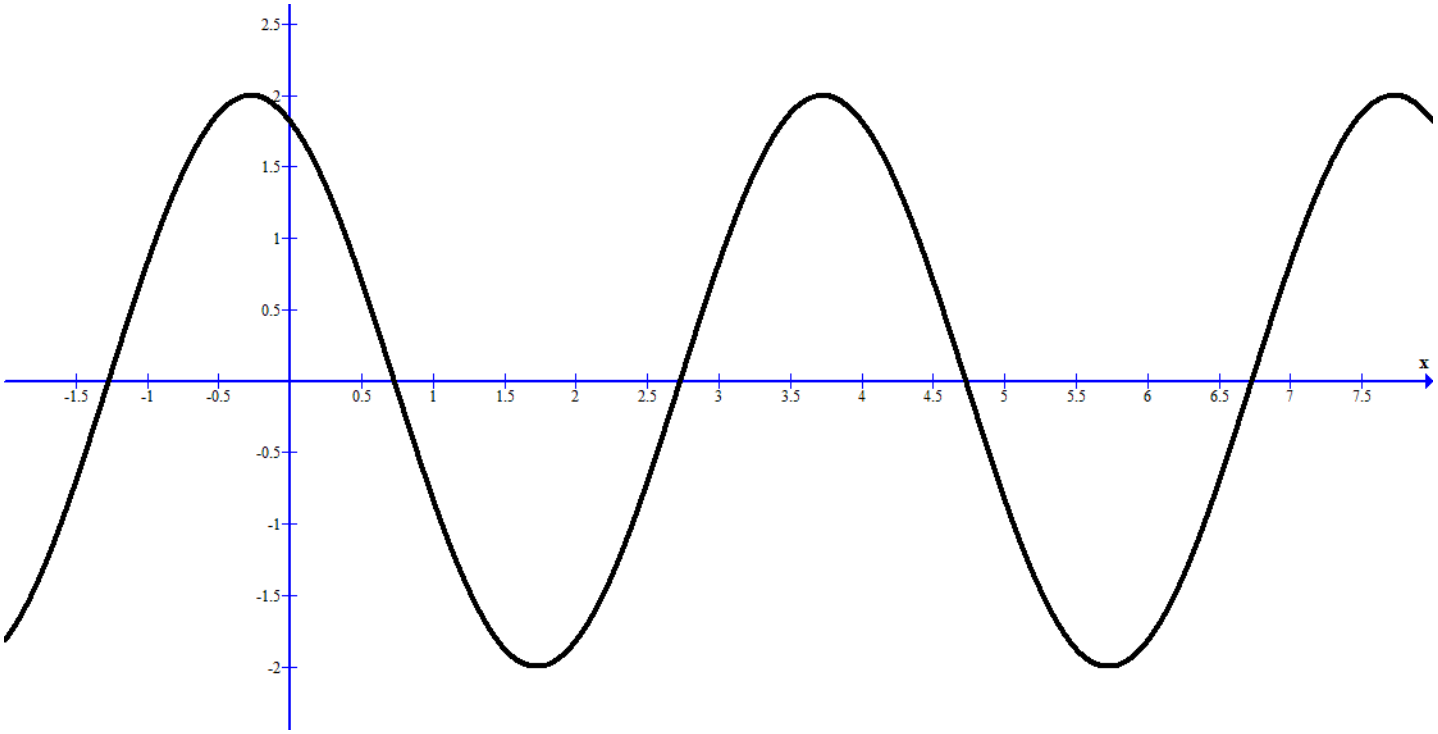

f. $f(x) = \sin\left(-\frac{x}{\pi} + 1\right) - 1$.

Ans: Start Point: $x = \pi$; amplitude $= 1$; period $= 2\pi^2$; End Point: $x = \pi + 2\pi^2$; neutral position at $x = \pi + \frac{\pi^2}{2}$; min at $x = \pi + \frac{\pi^2}{4}$; max at $x = \pi + \frac{3\pi^2}{4}$;



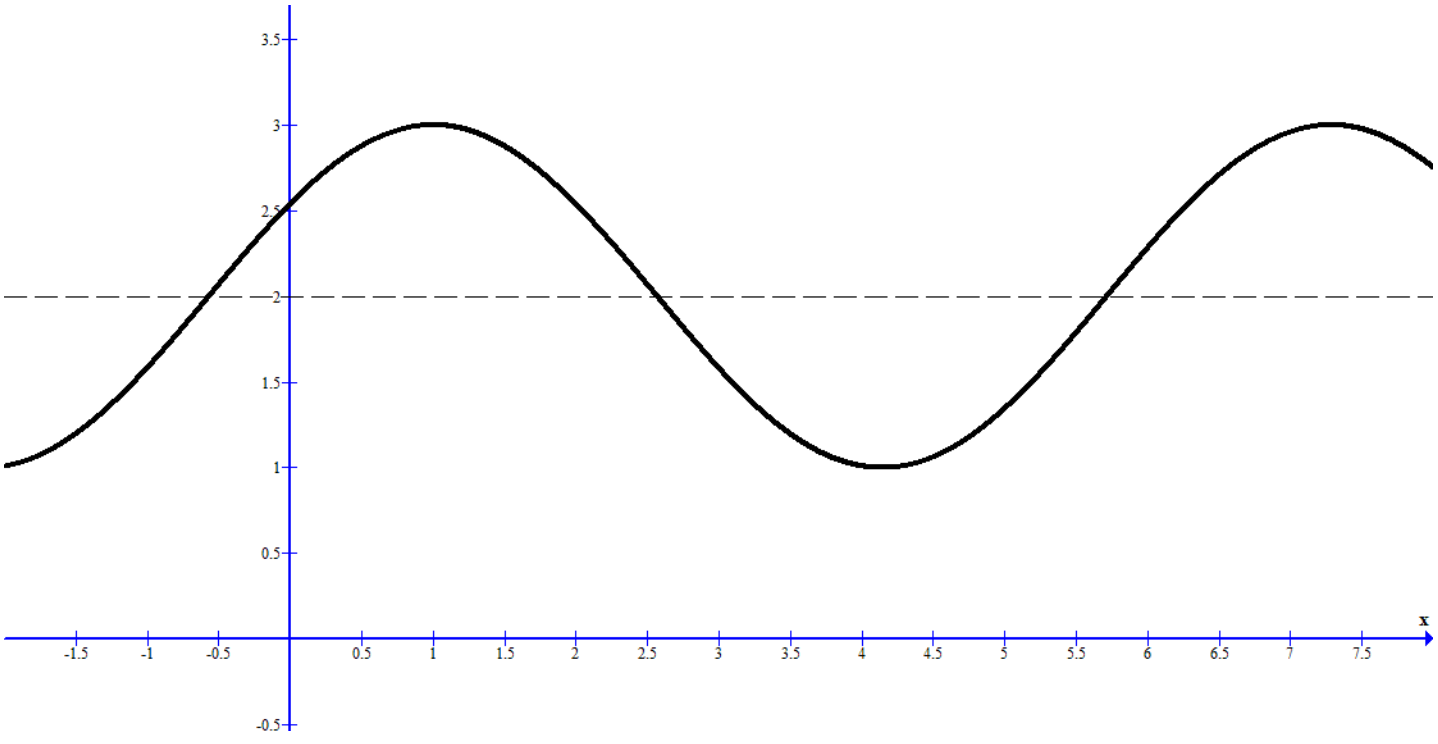
g. $f(x) = 2\sin\left(\dfrac{\pi x}{2} + 2\right)$.

Ans: Start Point: $x = -\dfrac{4}{\pi}$; amplitude $= 2$; period $= 4$; End Point: $x = -\dfrac{4}{\pi} + 4$;
neutral position at $x = -\dfrac{4}{\pi} + 2$; min at $x = -\dfrac{4}{\pi} + 3$; max at $x = -\dfrac{4}{\pi} + 1$;



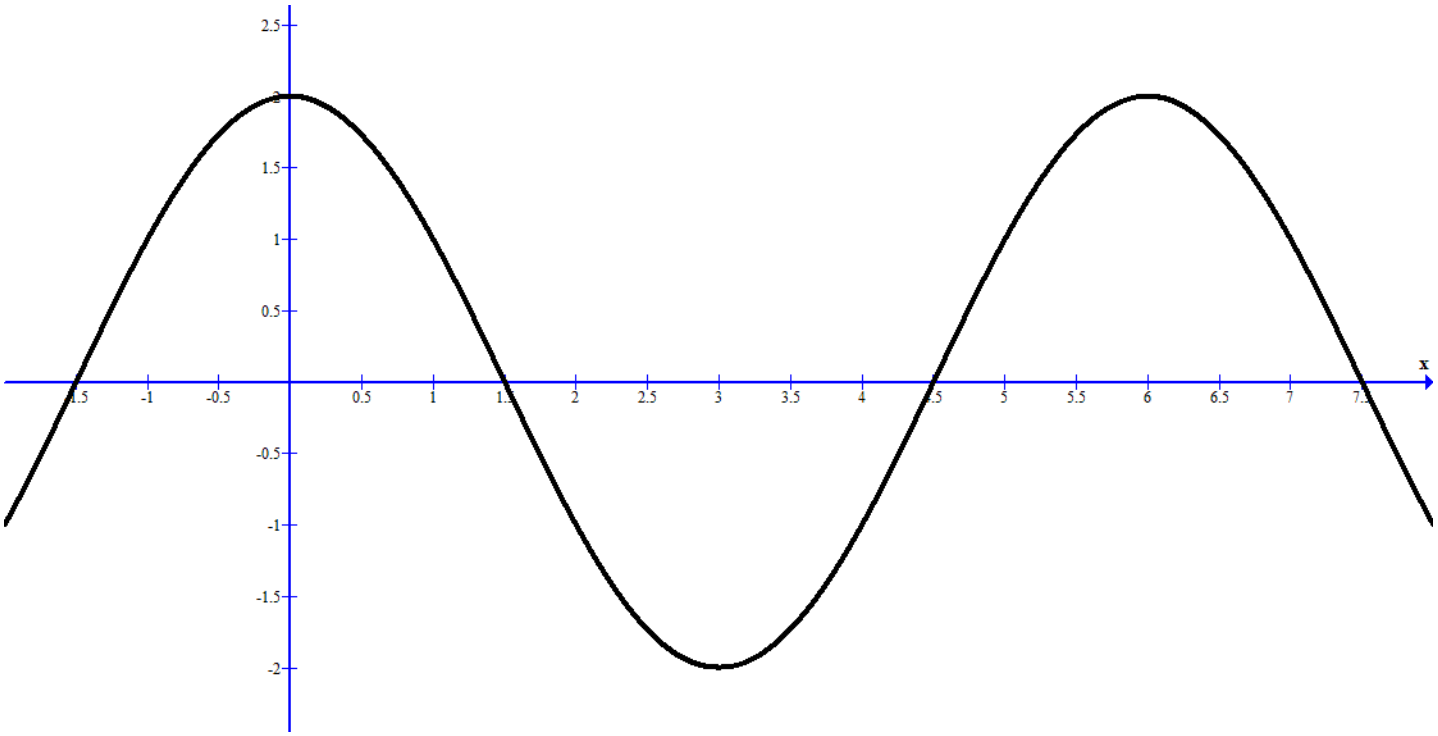

h. $f(x) = \cos(-x + 1) + 2$.

Ans: Start Point: $x = 1$; amplitude $= 1$; period $= 2\pi$; End Point: $x = 1 + 2\pi$;
neutral positions at $x = 1 + \dfrac{\pi}{2}$ and $x = 1 + \dfrac{3\pi}{2}$; min at $x = 1 + \pi$;



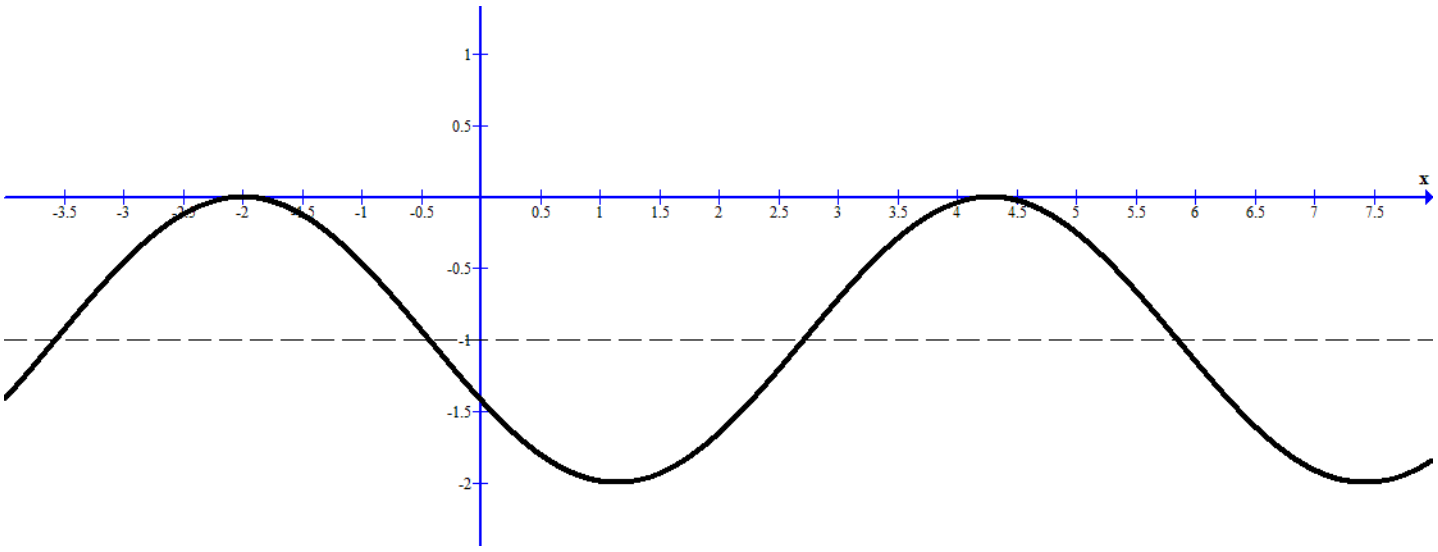
i. $f(x) = -2\cos\left(\dfrac{\pi x}{3} - \pi\right)$.

Ans: Start Point: $x = 3$; amplitude $= 2$; period $= 6$; End Point: $x = 9$; neutral positions at $x = \dfrac{9}{2}$ and $x = \dfrac{15}{2}$; max at $x = 6$



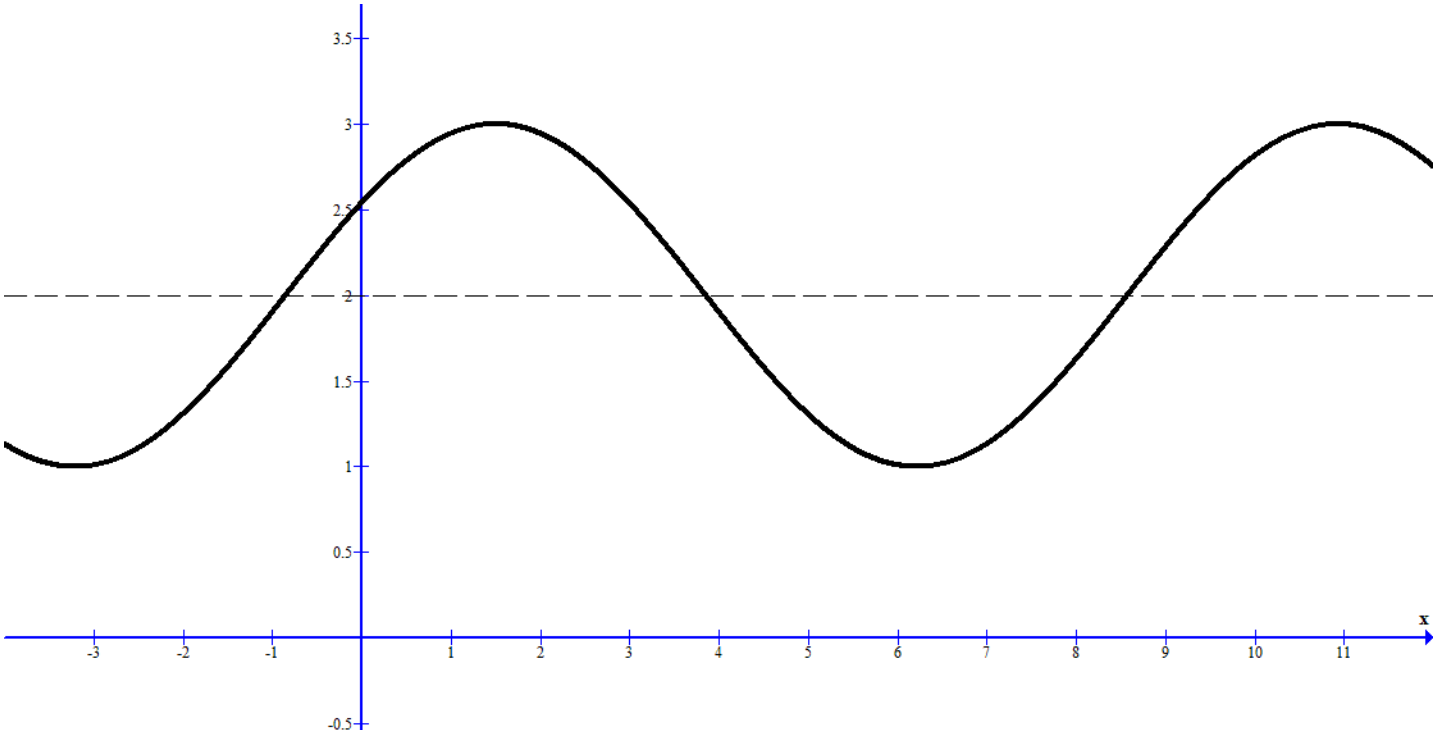

j. $f(x) = \cos(-x - 2) - 1$.

Ans: Start Point: $x = -2$; amplitude $= 1$; period $= 2\pi$; End Point: $x = 2 + 2\pi$; neutral positions at $x = -2 + \dfrac{\pi}{2}$ and $x = -2 + \dfrac{3\pi}{2}$; min at $x = -2 + \pi$;



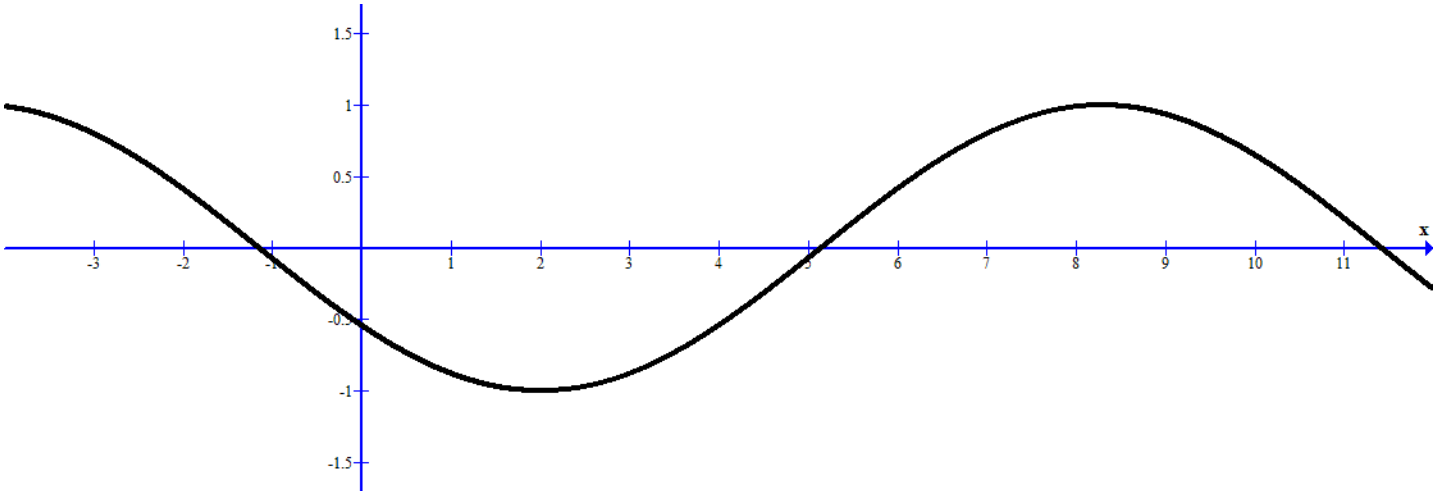
k. $f(x) = \cos\left(\frac{2x}{3} - 1\right) + 2.$

Ans: Start Point: $x = \frac{3}{2}$; amplitude $= 1$; period $= 3\pi$; End Point: $x = \frac{3}{2} + 3\pi$; neutral positions at $x = \frac{3}{2} + \frac{3\pi}{4}$ and at $x = \frac{3}{2} + \frac{9\pi}{4}$; min at $x = \frac{3 + 3\pi}{2}$;



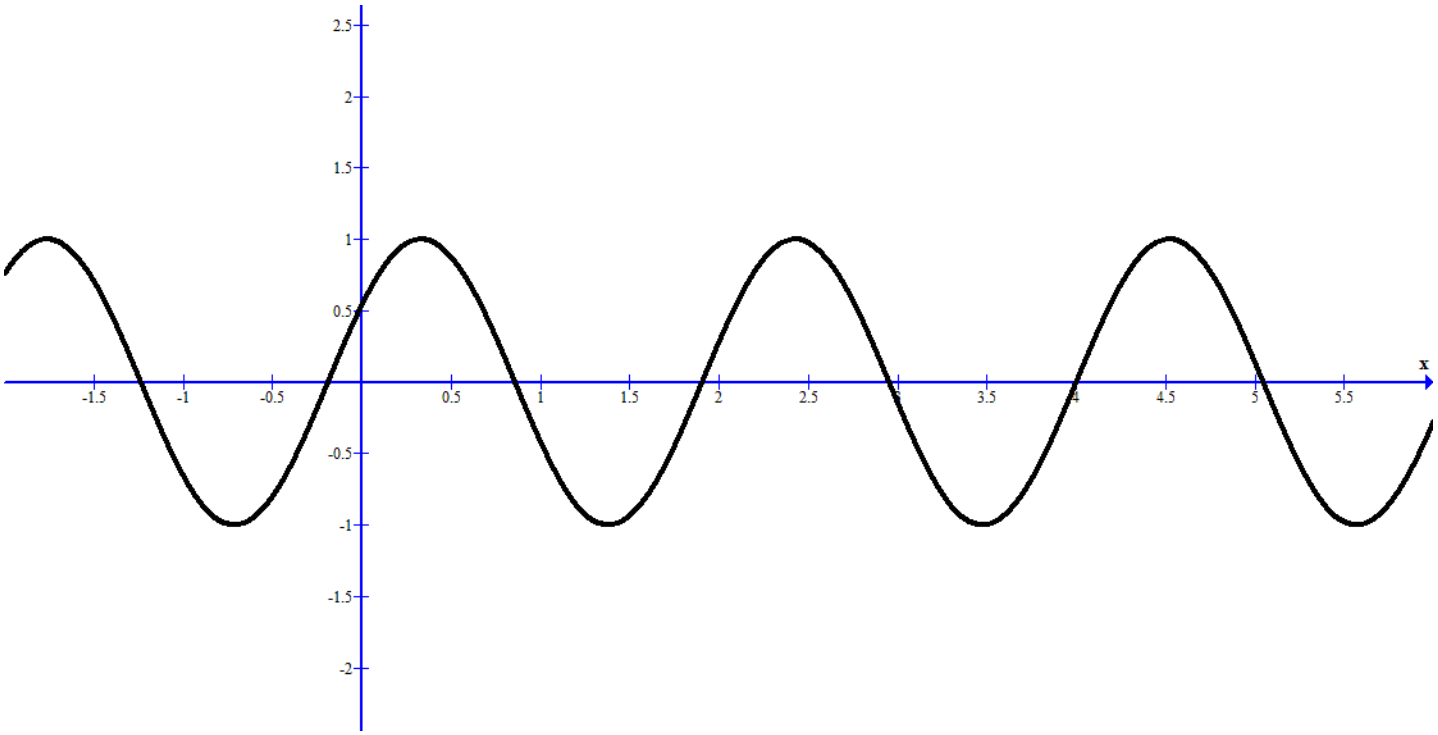

l. $f(x) = -\cos\left(-\frac{x}{2} + 1\right).$

Ans: Start Point: $x = 2$; amplitude $= 1$; period $= 4\pi$; End Point: $x = 2 + 4\pi$; neutral positions at $x = 2 + \pi$ and $x = 2 + 3\pi$; max at $x = 2 + 2\pi$;



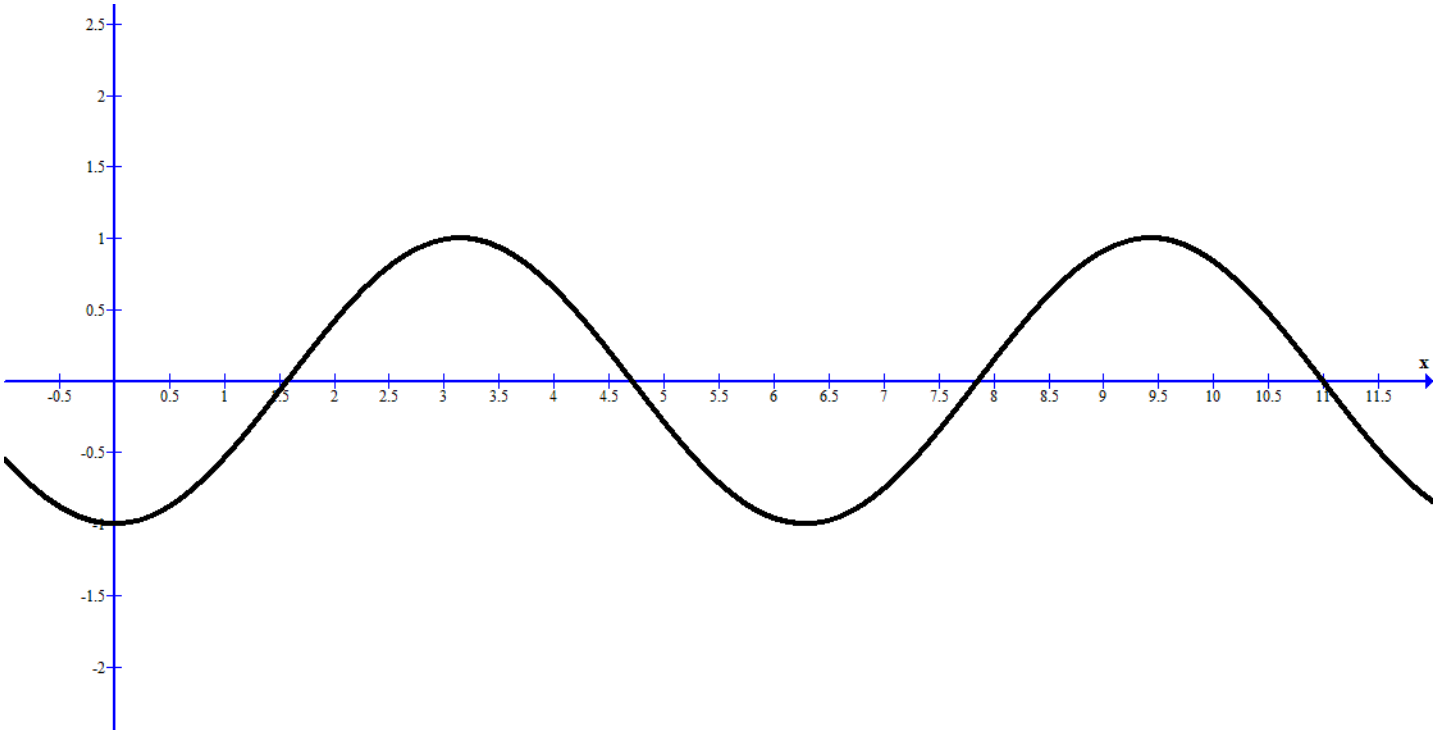
m. $f(x) = \cos(-3x + 1)$.

Ans: Start Point: $x = \frac{1}{3}$; amplitude $= 1$; period $= \frac{2\pi}{3}$; End Point: $x = \frac{1}{3} + \frac{2\pi}{3}$; neutral positions at $x = \frac{1}{3} + \frac{\pi}{6}$ and $x = \frac{1}{3} + \frac{\pi}{2}$; min at $x = \frac{1+\pi}{3}$;




n. $f(x) = \cos(x - \pi)$.

Ans: Start Point: $x = \pi$; amplitude $= 1$; period $= 2\pi$; End Point: $x = 3\pi$; neutral positions at $x = \frac{3\pi}{2}$ and $x = \frac{5\pi}{2}$; min at $x = 2\pi$;



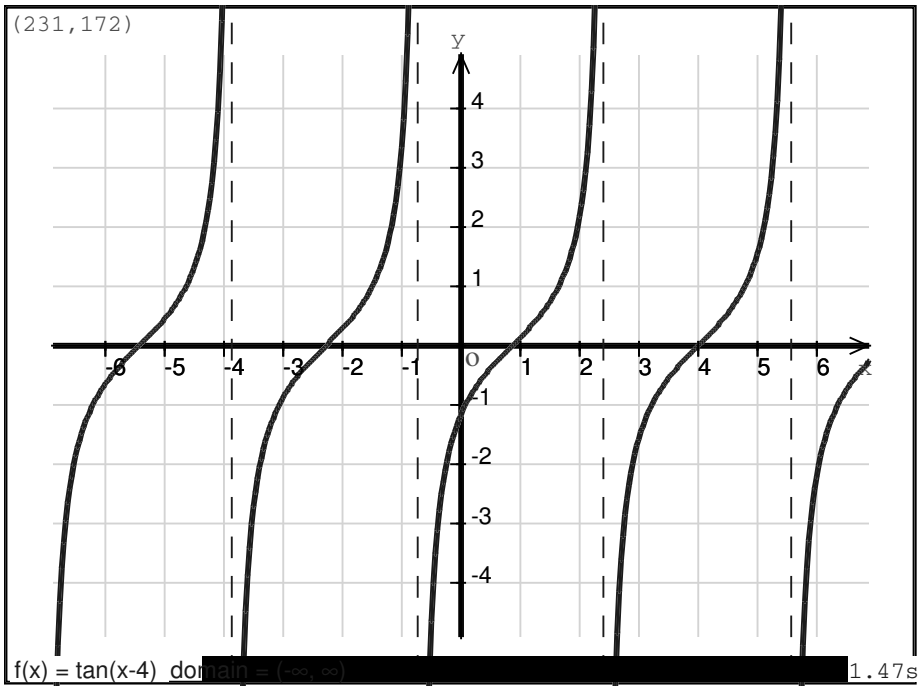
2. Let $f(x) = \tan(x - 4)$.

a. Find the *period* of $f$.

Ans: $p = \pi$

b. Graph $f$. In your graph, for at least one cycle of $f$, indicate the coordinates of the $x$ intercept, and the location of the vertical asymptotes.

Ans:



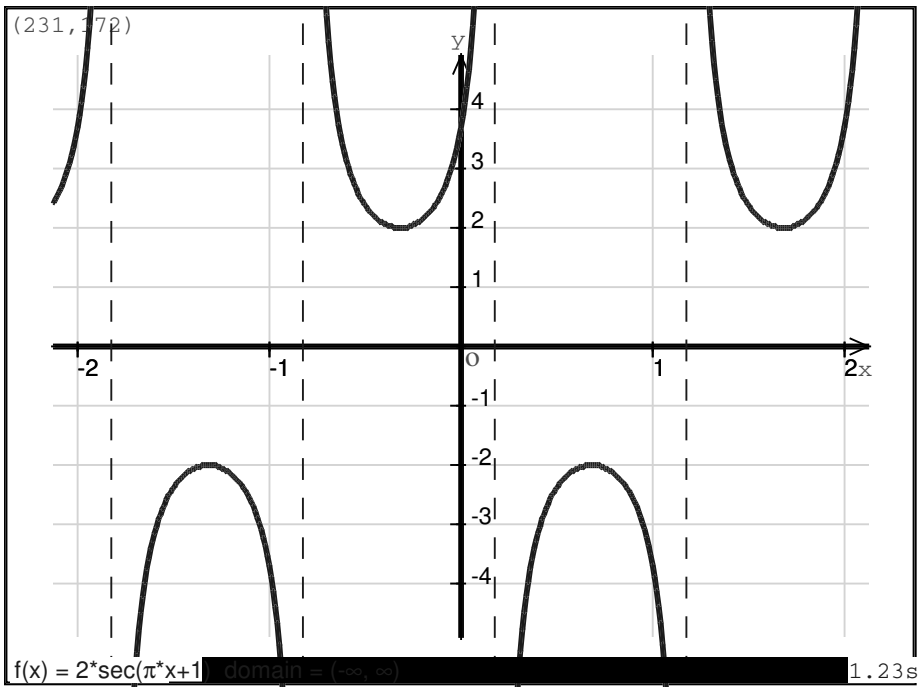

3. Let $f(x) = 2\sec(\pi x + 1)$.

a. Find the *period* of $f$.

Ans: $p = 2$

b. Graph $f$. In your graph, for at least one cycle of $f$, indicate the coordinates of the $x$ maximum and minimum values of $f$, and the location of the vertical asymptotes.

Ans:


(231,172)
y
4
3
2
1
-2
-1
o
1
2x
-1
-2
-3
-4
f(x) = 2*sec(π*x+1
domain = (-∞, ∞)
1.23s