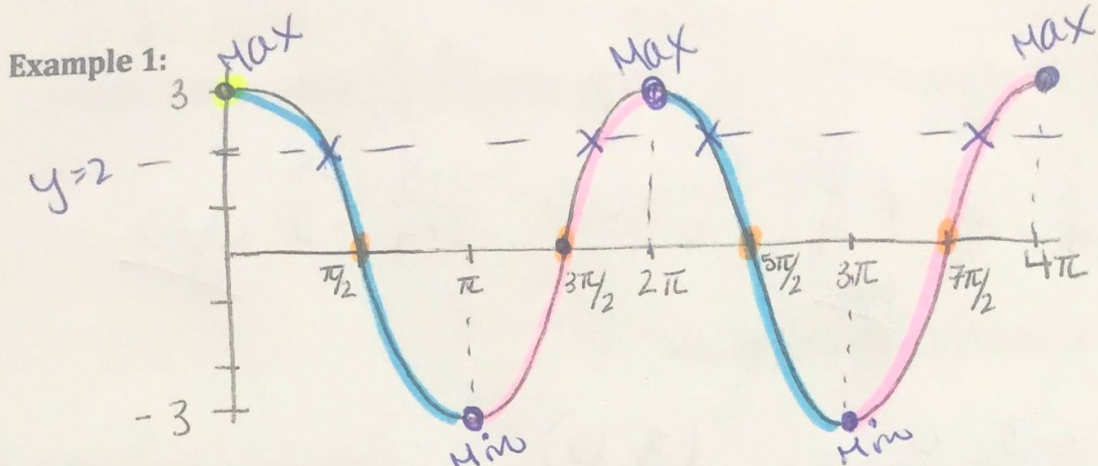


Notes - Interpreting Graphs of Functions (and Other Odds and Ends)



What are $f(0)$, $f(\frac{3\pi}{2})$, and $f(3\pi)$?

$f(0) = 3$ $f(\frac{3\pi}{2}) = 0$ $f(3\pi) = -3$

What is the domain of f ?

$[0, 4\pi]$

What is the range of f ?

$[-3, 3]$

List all intercepts (x and y):

$x: \pi/2, 3\pi/2, 5\pi/2, 7\pi/2$
 $y: 3$

How often does the line $y=2$ intersect the graph?

4 times

For what values of x does $f(x) = -4$?

none

For what values of x is $f(x) > 0$?

$[0, \pi/2) \cup (3\pi/2, 5\pi/2) \cup (7\pi/2, 4\pi]$

For what values of x is the function increasing?

$(\pi, 2\pi) \cup (3\pi, 4\pi)$

For what values of x is the function decreasing?

$(0, \pi) \cup (2\pi, 3\pi)$

For what values of x does the function have a local maximum?

$0, 2\pi, 4\pi$

For what values of x does the function have a local minimum?

$\pi, 3\pi$

Example 2: $f(x) = \frac{x-3}{x+4}$

Is the point $(1, \frac{3}{4})$ on the graph?

$$f(1) = \frac{1-3}{1+4} = \frac{-2}{5} \neq \frac{3}{4}$$

NO

Is the point $(-2, \frac{-5}{2})$ on the graph?

$$f(-2) = \frac{-2-3}{-2+4} = \frac{-5}{2}$$

yes

If $x = 3$, what is $f(x)$? What is the ordered pair?

$$f(3) = \frac{3-3}{3+4} = \frac{0}{7} = 0 \quad (3, 0)$$

If $f(x) = 3$, what is x ?

$$(x+4)3 = \frac{x-3}{x+4} \quad (\cancel{x+4})$$

$$\begin{aligned} 3x+12 &= x-3 \\ -x & \quad -x \\ \hline 2x+12 &= -3 \\ -12 & \quad -12 \\ \hline 2x &= -15 \\ \frac{2x}{2} &= \frac{-15}{2} \end{aligned}$$

$$x = \frac{-15}{2} = -7.5$$

$x=0$

What is the y-intercept of the graph?

$$f(0) = \frac{0-3}{0+4} = \frac{-3}{4}$$

$y=0$

What are the x-intercepts of the graph of f ?

$$(x+4)0 = \frac{x-3}{x+4} \quad (\cancel{x+4})$$

$$\begin{aligned} 0 &= x-3 \\ +3 & \quad +3 \\ \hline 3 &= x \end{aligned}$$