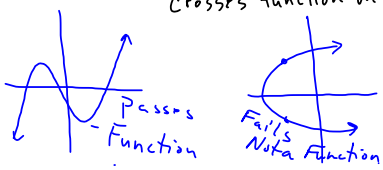
3.2 Functions

Vertical Line test

Crosses function only once



If $(4,-1)$ is on the graph

then $f(\ ) = \_\_$

Find a so that $(-1,2)$ is on the graph

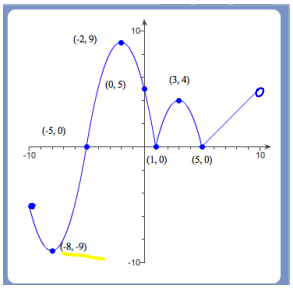
$f(x) = ax^2 + 5$

$2 = a(-1)^2 + 5$

$2 = a + 5$

$-3 = a$

$f(x) = -3x^2 + 5$



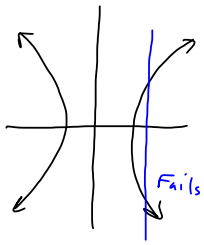
Find $f(-8) = -9$ (x → −8, y ← −9)

$f(-2) = 9$

Is $f(3)$ pos or Neg?

pos

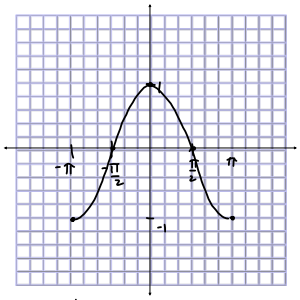
Domain: $[-10, 10)$ OR $\{x \mid -10 \le x < 10\}$



Function? No

Domain and Range of the function?

Not a Function



Function? Yes

Domain? $[-\pi, \pi]$

Range? $[-1, 1]$

Intercepts? $(-\frac{\pi}{2}, 0), (0,1), (\frac{\pi}{2}, 0)$

Symmetry?

y-axis, Even

$f(x) = 4x^2 - x - 3$

(a) Is $(2,11)$ on the graph?

$11 = 4(2)^2 - (2) - 3$

$11 = 11$ yes

(b) $x = -2$ what is $f(x)$?

$f(x) = 4(-2)^2 - (-2) - 3$

$f(x) = 15$

(c) Intercepts

$4(0)^2 - (0) - 3 = -3$

$(0, -3)$

$4x^2 - x - 3 = 0$

$4x^2 - 4x + 3x - 3 = 0$ (12, −4, 3x)

$4x(x-1) + 3(x-1)$

$(x-1)(4x+3) = 0$

$(1,0)$ $(-\frac{3}{4}, 0)$

(d) Domain?

$(-\infty, \infty)$

$h(x) = -\frac{44x^2}{v^2} + x + 6$

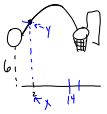
Velocity 29 ft/sec

Find the height of the ball after it is 2 ft. from the foul line.

$\frac{-44(2)^2}{29^2} + 2 + 6 = 7.7$ ft.

Find the height of the ball after it is 14 ft. from the foul line.

$\frac{-44(14)^2}{29^2} + 14 + 6 = 9.7$ ft.



Pick graph:

Does he make it? (height 10 ft, distance 15)

$\frac{-44(15)^2}{29^2} + 15 + 6 = 10$ No Under the Basket

What velocity to make it?

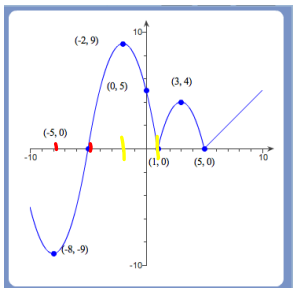
$\frac{-44(15)^2}{v^2} + 15 + 6 = 10$

$\frac{-44(15)^2}{v^2} = -11$

$-44(15)^2 = -11v^2$

$\frac{-44(15)^2}{-11} = v^2$ $v = 30$

3.3 Functions

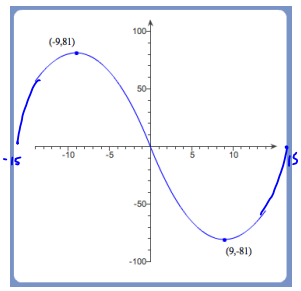


Is f strictly increasing on the interval $(-2, 1)$?

No, Decreasing

Increasing $(-8, -5)$

yes



Intervals increasing:

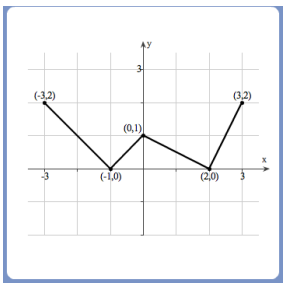
$(-15, -9) \cup (9, 15)$

Is there a local minimum at $x = -9$?

NO, This is a MAX

What is the local max?

$(-9, 81)$



a) the intercepts

$(-1, 0), (0, 1), (2, 0)$

b) Domain $[-3, 3]$

Range $[0, 2]$

c) Intervals:

Increasing $(-1, 0) \cup (2, 3)$

Decreasing $(-3, -1) \cup (0, 2)$

Constant None

d) odd, even or neither

Odd, even or Neither

$g(x) = 2x^3 + 5$ Neither

$f(x) = \sqrt[3]{6x}$ Odd

$f(x) = \frac{-2x}{7x^2 + 5}$

$\frac{-2(-x)}{7(-x)^2 + 5} = \frac{2x}{7x^2 + 5}$

Odd

$\sqrt[3]{x}$ -27 -1 -3 3 27