

Quiz #3

1. How did you prepare for the first test? Please be specific.
2. What do you plan to do differently for the next test? (e.g. go to Math Lab more often, work more homework problems, take more practice tests, etc.; maybe you don't plan to do anything differently?)
3. How well-prepared did you think you were for the test before you took it? What grade did you expect to make?
4. After taking the test, how well-prepared were you actually? What grade do you think you made?
5. Do you think that you will do more homework problems from the book from now on, watch more videos on Khan Academy, work more practice problems on Khan Academy, all three, none, or some combination? Which do you think you do enough of already and which do you think you need to do more of?

3.2 Introduction to Functions

relation - set of ordered pairs

function - relation in which no two ordered pairs have the same first coordinate and different second coordinates

Is this relation a function?

$\{(1,2), (3,4), (5,6), (6,1), (7,2)\}$ yes

$\{(1,2), (3,4), (1,5), (2,4)\}$ no

$\{(1,2), (2,2), (3,2), (4,2), (5,2)\}$ yes

$\{(3,2), (4,2), (5,2), (2,2), (2,3)\}$ no

$$y = 3x^2 - 2x$$

$$(0, 0)$$

$$(1, 1)$$

$$(-1, 5)$$

$$3(-1)^2 - 2(-1)$$

$$(-1)^2 \neq -1^2$$

"

$$-(1^2)$$

-1

x is the independent variable
(we have a choice of what x values to plug in)

y is the dependent variable
(once we choose x, y is determined)

\Rightarrow y is a function of x

functional notation: $y = f(x)$

"f of x"



not ~~f "times" x~~

Evaluating a Function

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

$$f(2) = 3(2)^2 - 2(2) = \boxed{8} \quad (2, 8)$$

$$f(-3) = 3(-3)^2 - 2(-3) = \boxed{33} \quad (-3, 33)$$

$$h(t) = 7 - 2t$$

$$h(-5) = 17$$

$$h(4) = -1$$

$$(-5, 17)$$

$$(4, -1)$$

$$(x, 7 - 2x)$$

$$(x+4, -2x-1)$$

$$h(x) = 7 - 2x$$

$$h(x+4) = 7 - 2(x+4)$$

$$= 7 - 2x - 8$$

$$= \boxed{-2x - 1}$$

$$(x, y)$$

$$(x, f(x))$$

Domain & Range

$$f(x) = \frac{1}{x}$$

$$x \neq 0$$

Domain: the set of real numbers for which the function value is a real number (the set of x-values that "make sense" when plugged into the function)

★ exclude any values that give us zero in the denominator & negatives under radicals

$$\sqrt{-2} \quad ; \quad \frac{1}{0}$$

What values are not in the domain?

$$f(x) = \frac{3}{x-4}, \quad x \neq 4$$

$$f(x) = \frac{x+3}{x-7}, \quad x \neq 7$$

$$f(x) = \frac{2x^2}{(x-1)(x+5)}, \quad x \neq 1, -5$$

What is the domain?

$$f(x) = \sqrt{x} \quad \{x \mid x \geq 0\}$$

$$f(x) = \sqrt{x+2} \quad \begin{array}{l} x+2 \geq 0 \\ x \geq -2 \end{array} \quad \{x \mid x \geq -2\}$$

$$f(x) = \sqrt{5-x} \quad \begin{array}{l} 5-x \geq 0 \\ 5 \geq x \\ x \leq 5 \\ -x \geq -5 \\ \underline{-1} \quad \underline{-1} \\ x \leq 5 \end{array} \quad \{x \mid x \leq 5\}$$

Range: output of domain

$$\{(1,2), (3,4), (5,6)\}$$

domain: $\{1,3,5\}$

x-value

range: $\{2,4,6\}$

y-value

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

domain: $\{-1, 2, 0\}$

range:

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

$$\left\{-\frac{5}{3}, \frac{2}{3}, -\frac{1}{2}\right\}$$

$$f(2) = \frac{3(2)-2}{2+4} = \frac{4}{6} = \frac{2}{3}$$

$$f(0) = \frac{3(0)-2}{0+4} = \frac{-2}{4} = -\frac{1}{2}$$

3.2 HW
 # 3-16, 21-44, 49-88