NOTES: 2.1

function: each element of the domain is paired with only one element in the range. (Use vertical line test to verify.)

f(x) → function notation…read as "f of x"
or "f at x"

EXAMPLE #1

Given: $g(x) = \frac{2}{3}x + \frac{1}{4}$

a. What is g(3)?

$g(3) = \frac{2}{3}(3) + \frac{1}{4}$

$= 2 + \frac{1}{4}$

$= \frac{8}{4} + \frac{1}{4} = \boxed{\frac{9}{4}}$

b. What is g(x+3)?

$g(x+3) = \frac{2}{3}(x+3) + \frac{1}{4}$

$= \frac{2}{3}x + 2 + \frac{1}{4}$

$= \boxed{\frac{2}{3}x + \frac{9}{4}}$

EXAMPLE #2: PIECEWISE FUNCTION

$$f(x)=\begin{cases} x^2-3 & \text{if } x<1 \\ 4x & \text{if } x\geq 1 \end{cases}$$

a. f(3)= $4(3)$ $=12$

b. f(-2)= $(-2)^2-3$ $=4-3$ $=1$

(subtract)

c. find the net change from -2 to 3

start **end**

$f(3)-f(-2)$

$12-1=11$

Ending point – starting point

Reminder from section 1.1:

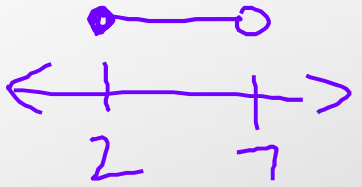
***SETS**

$\cup$ = union (all terms combined)

$\cap$ = intersection (common terms only)

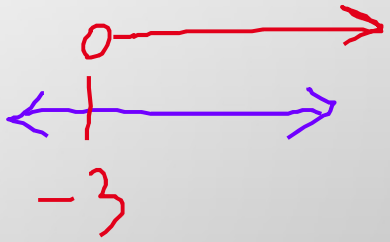
***INTERVALS**

$[2,7)$ $\quad 2 \le x < 7$



$(-3, \infty)$ $\quad -3 < x < \infty$

or $\quad x > -3$



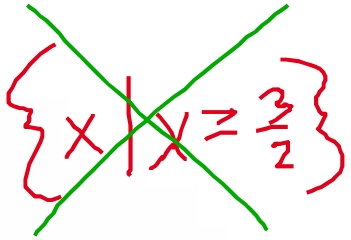
Reminder from section 1.4: Domain

Radical expressions: **(EVEN ROOTS ONLY!!)**

If given $\sqrt{x}$ → then solve $x \geq 0$

Fractional expressions:

If given $\frac{y}{x}$ → then solve $x \neq 0$



Example #3

State the domain. Show work and use interval notation for your final answer !

a. $f(x) = \sqrt{2x-3}$

$2x-3 \geq 0$

$2x \geq 3$

$x \geq \frac{3}{2}$ → $\left[\frac{3}{2}, \infty\right)$

interval notation

b. $g(x) = \frac{5x}{2x-3}$

$2x-3 \neq 0$

$x \neq \frac{3}{2}$

$\left(-\infty, \frac{3}{2}\right) \cup \left(\frac{3}{2}, \infty\right)$

PLEASE WRITE SECTION NUMBER AND PROBLEM NUMBERS AT THE TOP OF EACH HOMEWORK ASSIGNMENT!!

Also include:

first and last name

class period