Review:

Turn in Homework #1 (stapled in order,sections/ problems numbered, name on first page)

- 1.2: #15-29odd, #40,41,42,45,48, #59-70all
- 1.4: #35-47odd; 53-63odd
- 1.5: #1-16all, #47-53odd

1. Define:

a. function – a relation in which each input has exactly one output

b. domain – the set of all input values for which the function is defined

2. Write the domain in interval notation:

a. $f(x) = \sqrt{x-3}$ $\quad x-3 \geq 0$, $x \geq 3$ $\quad [3, \infty)$

b. $f(x) = \frac{2}{x+6}$ $\quad (-\infty, -6) \cup (-6, \infty)$

3. State the formula/equation:

a. Slope of the line that passes through the points (x_1, y_1) and (x_2, y_2). $\quad m = \frac{y_2 - y_1}{x_2 - x_1}$

b. Slope-intercept form of the equation of a line. $\quad y = mx + b$

c. Point-slope form of the equation of a line. $\quad y - y_1 = m(x - x_1)$

4. Fill in the blanks:

Two lines $y = m_1x + b_1$ and $y = m_2x + b_2$ are

a. parallel if $m_1 = m_2$ and $b_1 \neq b_2$

b. perpendicular if $m_1 = -\frac{1}{m_2}$. or $m_1 m_2 = -1$

5. Determine equations of the lines passing through the point $(-1, 2)$ that satisfy the following:

a. having zero slope $\quad y = 2$

b. having no slope $\quad x = -1$

c. perpendicular to the line $2x - 3y = 4$

$-3y = -2x + 4$

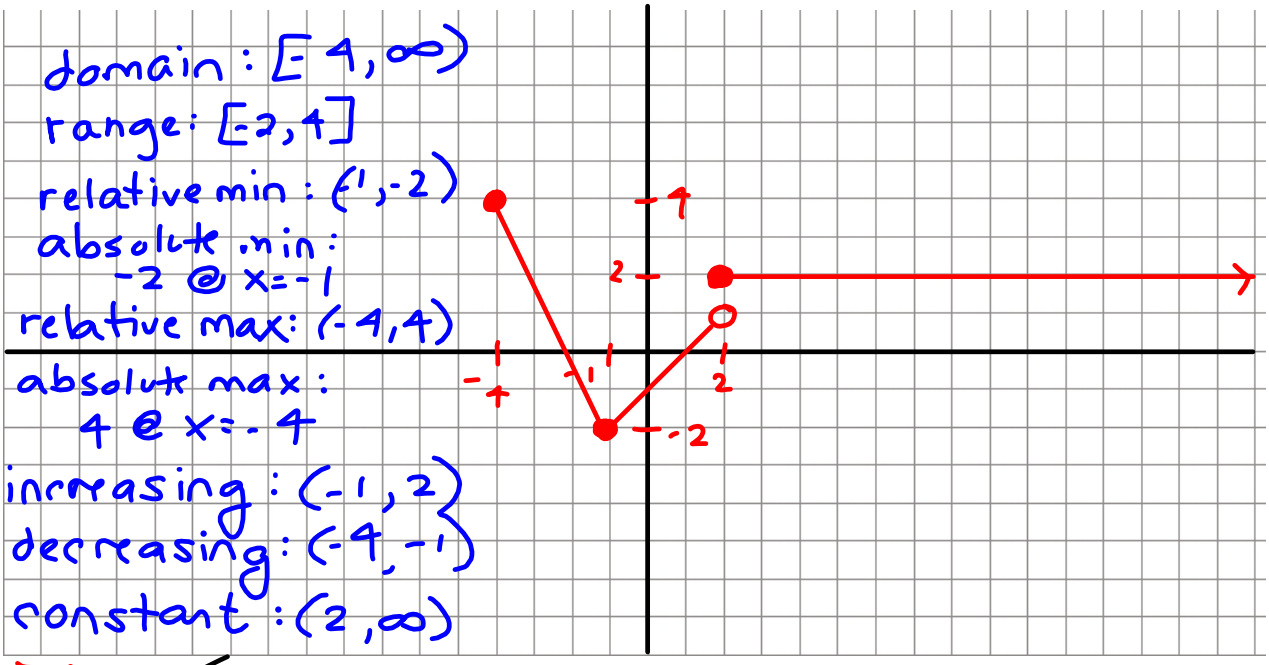
$y = \frac{2}{3}x - \frac{4}{3}$

$m = -\frac{3}{2}$

$y - 2 = -\frac{3}{2}(x - (-1))$

$y - 2 = -\frac{3}{2}x - \frac{3}{2}$

$\boxed{y = -\frac{3}{2}x + \frac{1}{2}}$



domain: $[-4, \infty)$

range: $[-2, 4]$

relative min: $(1, -2)$

absolute min: -2 @ $x = -1$

relative max: $(-4, 4)$

absolute max: 4 @ $x = -4$

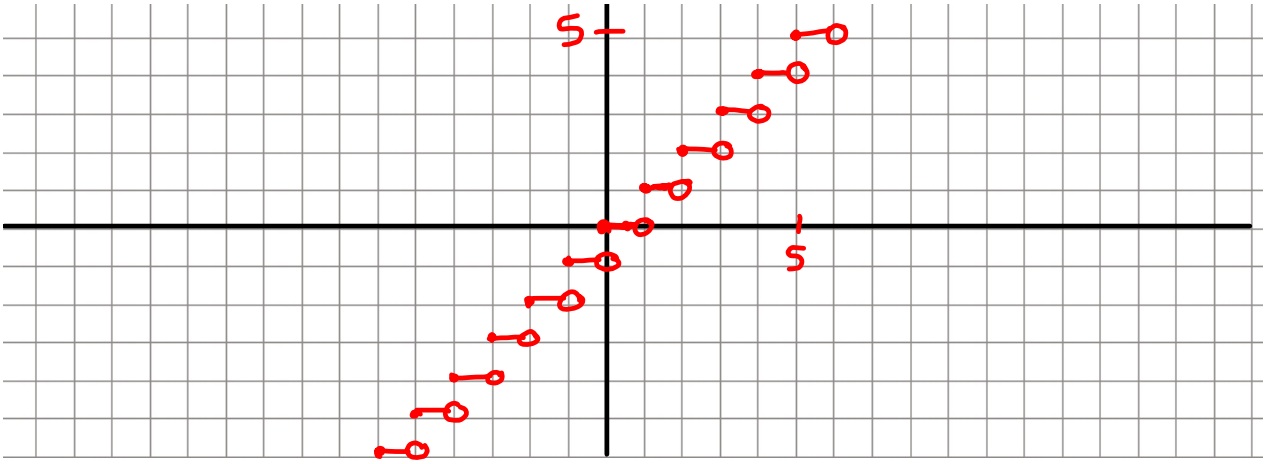
increasing: $(-1, 2)$

decreasing: $(-4, -1)$

constant: $(2, \infty)$

74.

$$f(x) = \begin{cases} -2x - 4 & , -4 \leq x \leq -1 \\ x - 1 & , -1 \leq x < 2 \\ 2 & , x \geq 2 \end{cases}$$

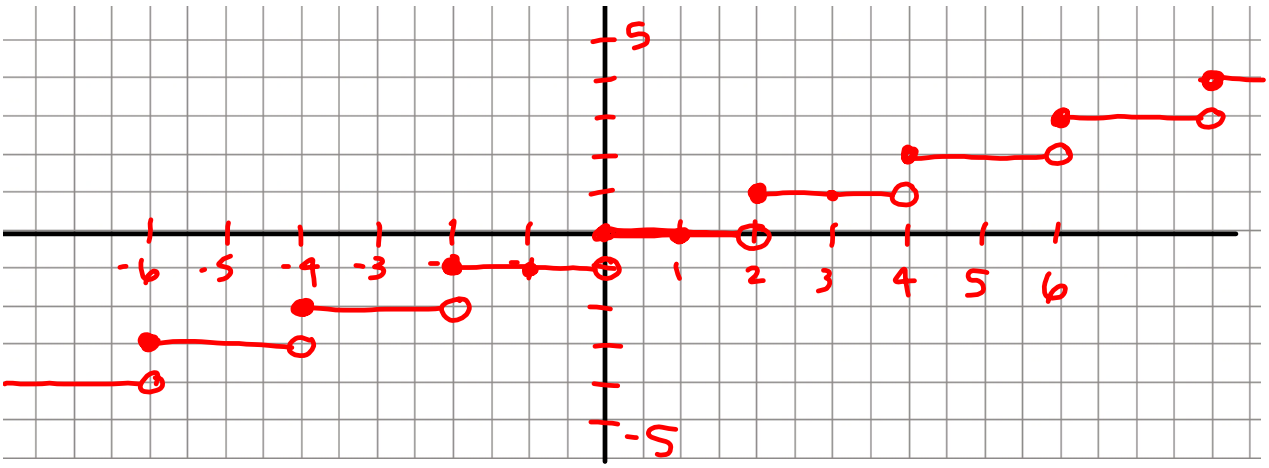


Greatest Integer Function

$[\![x]\!]$ = greatest integer less than or equal to x.

$y = [\![x]\!]$

"step function"



$y = [\![\frac{1}{2}x]\!]$

1.6 The Algebra of Functions

Given f & g, what are $(f+g)(x)$, $(f-g)(x)$, $(fg)(x)$, $\left(\frac{f}{g}\right)(x)$, $(f \circ g)(x)$, $(g \circ f)(x)$

$f(x) = x^2 - x$; $g(x) = x + 1$

$(f+g)(x) = f(x) + g(x) = x^2 - x + x + 1 = x^2 + 1$

domain: $(-\infty, \infty)$ range: $[1, \infty)$

$(f-g)(x) = f(x) - g(x) = x^2 - x - (x+1) = x^2 - 2x - 1$

domain: $(-\infty, \infty)$ range: TOO HARD! :(

$(fg)(x) = f(x) \cdot g(x) = (x^2 - x)(x+1) = x^3 + x^2 - x^2 - x = x^3 - x$

domain: $(-\infty, \infty)$ range: $(-\infty, \infty)$ (b/c it's an odd polynomial)

$\left(\frac{f}{g}\right)(x) = \frac{f(x)}{g(x)} = \frac{x^2 - x}{x+1}$

domain: $(-\infty, -1) \cup (-1, \infty)$

$(f \circ g)(x) = f(g(x)) =$

domain:

$(g \circ f)(x) = g(f(x)) =$

HW #2 (due next Fri, 08/22--TestDay!)

- 1.5: #55-61odd (determining function values of & graphing piecewise functions)
  #69-74all (finding domain, range & equation given graph of a piecewise function)
- 1.6: #23,29,31; 45, 49, 51; 63, 71,75; 81, 83 (algebra of functions)
- 1.7: #9,11,21,23; 39-47odd (symmetry tests)

Quiz #1 - Monday, 8/18

Test #1 - Friday, 8/22