

Chapter 7

REVIEW

Assignment

Complete pgs. 410 -411

**Questions 1, 2, 3, 5, 6bc,
7bc, 8, 12(ab)**

Solutions

1. Evaluate.

$$\begin{aligned} \text{a) } & |-5| \\ & = 5 \end{aligned}$$

$$\begin{aligned} \text{b) } & \left| 2\frac{3}{4} \right| \\ & = 2\frac{3}{4} \end{aligned}$$

$$\begin{aligned} \text{c) } & |-6.7| \\ & = 6.7 \end{aligned}$$

2. Rearrange these numbers in order from least to greatest.

$$-4, \sqrt{9}, |-3.5|, -2.7, \left| -\frac{9}{2} \right|, |-1.6|, \left| 1\frac{1}{2} \right|$$

$$\Rightarrow -4, 3, 3.5, -2.7, \frac{9}{2} \text{ or } 4.5, 1.6, 1.5$$

From least to greatest:

$$-4, -2.7, \left| 1\frac{1}{2} \right|, |-1.6|, \sqrt{9}, |-3.5|, \left| -\frac{9}{2} \right|$$

$$\begin{aligned} \text{3a) } & |-7-2| \\ & = |-9| \\ & = 9 \end{aligned}$$

$$\begin{aligned} \text{b) } & |-3+1|-6| \\ & = |8-6| \\ & = |2| \\ & = 2 \end{aligned}$$

$$\begin{aligned} \text{c) } & 5|-3.75| \\ & = 5(3.75) \\ & = 18.75 \end{aligned}$$

$$\begin{aligned} \text{d) } & |5^2-7| + |-10+2^3| \\ & = |25-7| + |-10+8| \\ & = |18| + |-2| \\ & = 18 + 2 \\ & = 20 \end{aligned}$$

Solutions

5. Over the course of five weekdays, one mining stock on the Toronto Stock Exchange (TSX) closed at \$4.28 on Monday, closed higher at \$5.17 on Tuesday, finished Wednesday at \$4.79, and shot up to close at \$7.15 on Thursday, only to finish the week at \$6.40.

a) What is the net change in the closing value of this stock for the week?

The net change in the closing value of this stock is the change from the start of the week to the end of the week.

$$\begin{aligned} \Rightarrow & \$6.40 - \$4.28 \\ & = \$2.12 \end{aligned}$$

b) Determine the total change in the closing value of the stock.

$$\text{Let } V_1 = 4.28, V_2 = 5.17, V_3 = 4.79, V_4 = 7.15 \text{ \& } V_5 = 6.40.$$

$$\begin{aligned} & |V_2 - V_1| + |V_3 - V_2| + |V_4 - V_3| + |V_5 - V_4| \\ & = |5.17 - 4.28| + |4.79 - 5.17| + |7.15 - 4.79| + |6.40 - 7.15| \\ & = |0.89| + |-0.38| + |2.36| + |-0.75| \\ & = 0.89 + 0.38 + 2.36 + 0.75 \\ & = 4.38 \end{aligned}$$

The total change in the closing value of this stock is \$4.38.

Solutions

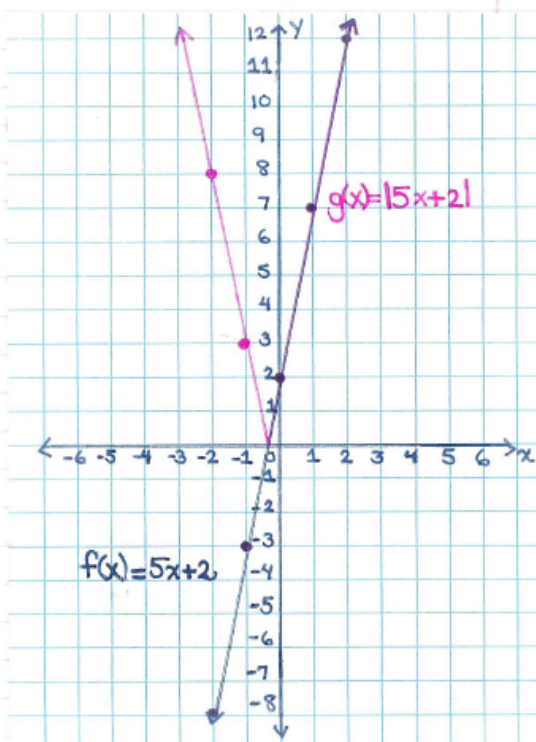
6. Consider the functions $f(x) = 5x + 2$ and $g(x) = |5x + 2|$.

b) Sketch the graphs of the functions on the same coordinate grid.

$$\Rightarrow f(x) = 5x + 2$$

$$m = \frac{5}{1} \text{ (up)} \\ \text{(over)}$$

$$y\text{-int} = 2$$



c) Determine the domain and range for both $f(x)$ and $g(x)$.

For $f(x)$:

$$\text{Domain: } \{x \mid x \in \mathbb{R}\}$$

$$\text{Range: } \{y \mid y \in \mathbb{R}\}$$

For $g(x)$:

$$\text{Domain: } \{x \mid x \in \mathbb{R}\}$$

$$\text{Range: } \{y \mid y \geq 0, y \in \mathbb{R}\}$$

Solutions

7. Consider the functions $f(x) = 8 - x^2$
and $g(x) = |8 - x^2|$

b) Sketch the graphs of the functions
on the same coordinate grid.

$$\Rightarrow f(x) = 8 - x^2$$

$$f(x) = -x^2 + 8$$

y-int:

$$y = -(0)^2 + 8$$

$$y = 0 + 8$$

$$y = 8$$

x-ints:

$$0 = -x^2 + 8$$

$$-8 = -x^2$$

$$8 = x^2$$

$$\pm\sqrt{8} = x$$

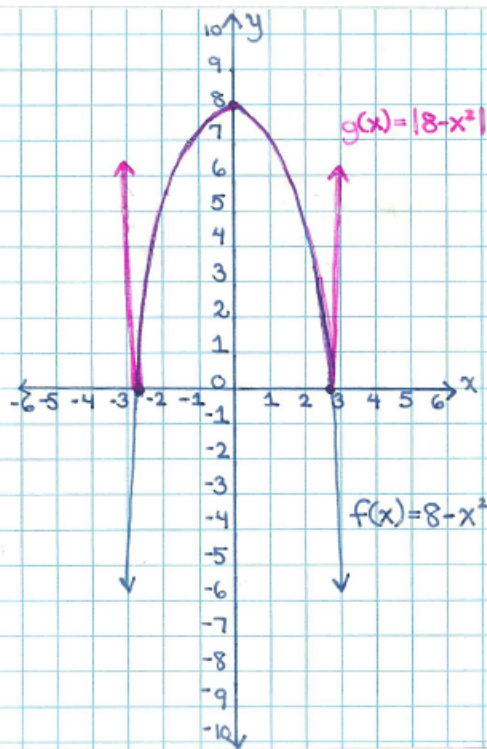
$$\pm 2.8 = x$$

Vertex:

$$y = -x^2 + 8$$

$$y = -(x - 0)^2 + 8$$

$$\Rightarrow (0, 8)$$



c) Determine the domain and range for both
 $f(x)$ and $g(x)$.

For $f(x)$:

$$\text{Domain: } \{x \mid x \in \mathbb{R}\}$$

$$\text{Range: } \{y \mid y \leq 8, y \in \mathbb{R}\}$$

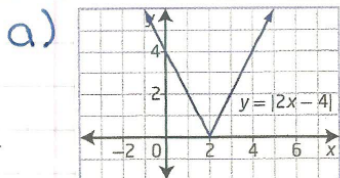
For $g(x)$:

$$\text{Domain: } \{x \mid x \in \mathbb{R}\}$$

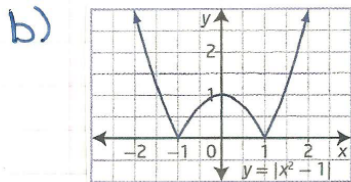
$$\text{Range: } \{y \mid y \geq 0, y \in \mathbb{R}\}$$

Solutions

8. Write the piecewise function that represents each graph.



$$y = \begin{cases} 2x-4, & \text{if } x \geq 2 \\ -(2x-4), & \text{if } x < 2 \end{cases}$$



$$y = \begin{cases} x^2-1, & \text{if } x \leq -1 \text{ or } x \geq 1 \\ -(x^2-1), & \text{if } -1 < x < 1 \end{cases}$$

12. Solve each equation algebraically.

a) $|q+9|=2$

$$\begin{aligned} q+9 &= 0 \\ q &= -9 \end{aligned}$$

$$|q+9| = \begin{cases} q+9, & q \geq -9 \\ -(q+9), & q < -9 \end{cases}$$

Case 1

$$\begin{aligned} q+9 &= 2 \\ q &= 2-9 \\ q &= -7 \end{aligned}$$

* $q = -7$ satisfies the condition $q \geq -9$.

Case 2

$$\begin{aligned} -(q+9) &= 2 \\ q+9 &= -2 \\ q &= -2-9 \\ q &= -11 \end{aligned}$$

* $q = -11$ satisfies the condition $q < -9$.

Solutions

$$b) |7x-3| = x+1 \quad \begin{array}{l} 7x-3=0 \\ \frac{7x}{7} = \frac{3}{7} \\ x = \frac{3}{7} \end{array} \quad |7x-3| = \begin{cases} 7x-3, & x \geq 3/7 \\ -(7x-3), & x < 3/7 \end{cases}$$

Case 1

$$7x-3 = x+1$$

$$7x-x = 1+3$$

$$\frac{6x}{6} = \frac{4}{6}$$

$$x = \frac{4}{6}$$

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

* $x = 2/3$ satisfies the condition $x \geq 3/7$.

Case 2

$$-(7x-3) = x+1$$

$$-7x+3 = x+1$$

$$-7x-x = 1-3$$

$$\frac{-8x}{-8} = \frac{-2}{-8}$$

$$x = \frac{2}{8}$$

$$x = \frac{1}{4}$$

* $x = 1/4$ satisfies the condition $x < 3/7$.