

Fundamental Math 10033 Chapter 1 Supplemental Problems

SECTION 1.1

Points Satisfying an Equation

- Determine whether the ordered pairs $(9, -4)$, $(6, -5)$, $(3, -6)$, $(24, -\frac{1}{2})$ are solutions to $\frac{1}{3}x - 2y = 12$.
- Determine whether the ordered pairs $(2, \frac{2}{3})$, $(\frac{1}{2}, -2\frac{2}{3})$, $(1, -3)$, $(2\frac{1}{4}, -\frac{1}{3})$ are solutions to $4x - 3y = 10$.
- Determine whether the ordered pairs $(-1, 3)$, $(2, -2\frac{2}{3})$, $(\frac{5}{2}, -\frac{3}{2})$, $(-4, -8)$ are solutions to $2x^2 + 3y = 8$.
- Determine whether the ordered pairs $(-3, 3)$, $(-4, -4)$, $(-6, -5)$, $(-\frac{4}{5}, 0)$ are solutions to $5|x| - y^2 = 4$.
- Determine whether the points $(1, -1)$, $(\frac{2}{3}, \frac{1}{2})$, $(-8, 2)$, $(-3, -3)$ are on the graph of $\frac{3x}{y^2} = x + 2$.
- Determine whether the points $(4, -2)$, $(-3, -3)$, $(\frac{3}{4}, -\frac{1}{2})$, $(9, -5)$ are on the graph of $2x + 1 = 4 - 3y$.
- Determine whether the points $(-2, \frac{1}{5})$, $(3, 0)$, $(2, -1)$, $(\frac{5}{3}, -2)$ are on the graph of $3xy + 2 = 4y$.
- Determine whether the points $(6, 0)$, $(-7, -2)$, $(10, -4)$, $(-6, -1)$ are on the graph of $\frac{1}{2}x^2 - 2y^2 = 16$.
- Determine the values of a and b so that $(a, \frac{2}{3})$ and $(-2, b)$ are solutions to $3x - 12y = 10$.
- Determine the values of a and b so that $(a, -9)$ and $(-1, b)$ are solutions to $\frac{3}{4}x + \frac{1}{2}y = \frac{1}{2}$.
- Determine the values of a and b so that $(a, -3)$ and $(-3, b)$ are solutions to $2x^2 - 5y = 15$.
- Determine the values of a and b so that $(a, \frac{1}{2})$ and $(-1, b)$ are solutions to $y - 2xy = x$.
- Determine the values of a and b so that $(a, 3)$ and $(\frac{1}{2}, b)$ are points on the graph of $\frac{4}{x} - 6y = 18$.
- Determine the values of a and b so that $(a, -2)$ and $(-2, b)$ are points on the graph of $-5|x| - y^2 + 6 = 0$.
- Determine the values of a and b so that $(a, -6)$ and $(-6, b)$ are points on the graph of $\frac{1}{3}x + \frac{1}{4}y^2 = 2$.
- Determine the values of a and b so that $(a, -1)$ and $(-2, b)$ are points on the graph of $0.4x - 3.2y = 5.6$.

SECTION 1.1

The Graph of an Equation

- Graph using at least six points:
 - $3x - 2y = 6$
 - $y - 2|x| = 8$
 - $\frac{1}{2}y + 4 = 3x$
 - $x^2 - 2y = 4$

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e. $2x - 4y^2 = 10$

f. $\frac{1}{2}y = x^3 - 2$

SECTION 1.1

Evaluating and Graphing Functions

1. Given $f(x) = -2x^2 + 3x - 5$, evaluate $f(-1)$, $f(0)$, $f(2)$.

2. Given $g(x) = -3|x| + 7x$, evaluate $g(-3)$, $g(0)$, $g(4)$.

3. Given $h(x) = x^3 - 2x + 1$, evaluate $h(-2)$, $h(1)$, $h(3)$.

4. Given $f(x) = \frac{15}{x+1}$, evaluate $f(-3)$, $f(0)$, $f(2)$.

5. Graph the following functions using at least 5 points.

a. $f(x) = \frac{1}{2}x - 4$

b. $g(x) = 5|x| - 6$

c. $h(x) = x^2 - 3x - 4$

d. $i(x) = x^3 - 10$

6. Determine the domain for the following functions.

a. $f(x) = 2x^4 - 3x^2 + 5$

b. $g(x) = \frac{|x|}{4}$

c. $h(x) = 7$

d. $i(x) = \frac{x+2}{x-1}$

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SECTION 1.1.

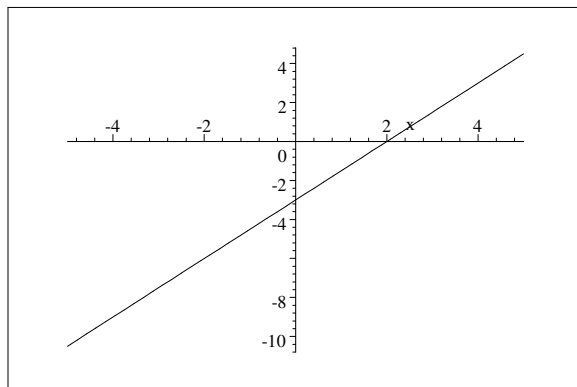
ANSWERS— Points Satisfying an Equation

1. $(6, -5)$
2. $(2\frac{1}{4}, -\frac{1}{3})$ and $(\frac{1}{2}, -2\frac{2}{3})$
3. $(-4, -8)$ and $(\frac{5}{2}, -\frac{3}{2})$
4. $(-4, -4)$ and $(-\frac{4}{5}, 0)$
5. $(1, -1)$, $(-8, 2)$ and $(-3, -3)$
6. $(9, -5)$
7. $(-2, \frac{1}{5})$, $(2, -1)$ and $(\frac{5}{3}, -2)$
8. $(-6, -1)$
9. $a = 6, b = -\frac{4}{3}$
10. $a = \frac{20}{3}, b = \frac{5}{2}$
11. $a = 0, b = \frac{3}{5}$
12. $a = \frac{1}{4}, b = -\frac{1}{3}$
13. $a = \frac{1}{9}, b = -\frac{5}{3}$
14. $a = \frac{2}{5}$ or $-\frac{2}{5}, b = \text{no solution}$
15. $a = -21, b = 4$ or -4
16. $a = 6, b = -2$

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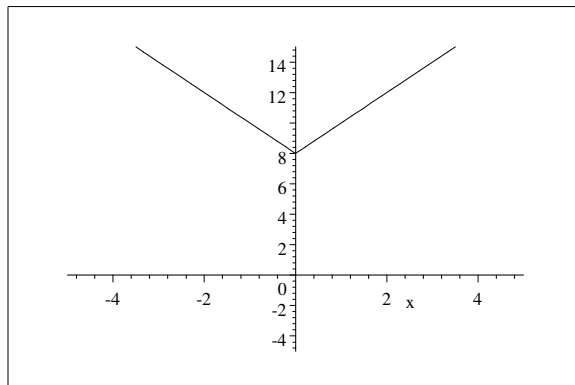
ANSWERS—The Graph of an Equation

- 1a. $3x - 2y = 6$, Solution is: $\{y = \frac{3}{2}x - 3\}$

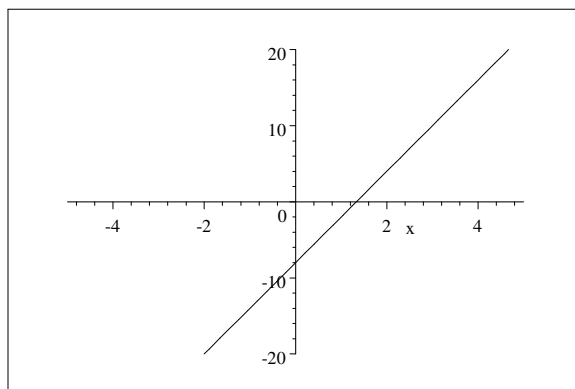


- b. $y - 2|x| = 8$, Solution is: $\{y = 2|x| + 8\}$

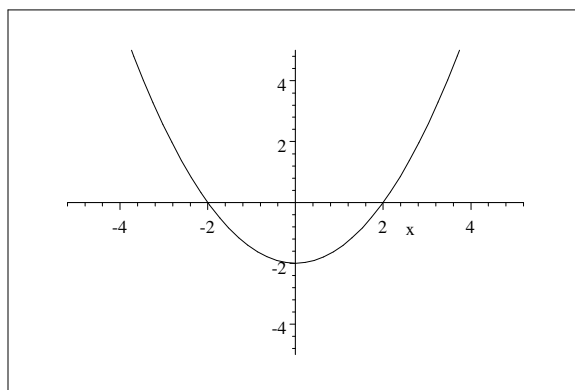
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c. $\frac{1}{2}y + 4 = 3x$, Solution is: $\{y = -8 + 6x\}$

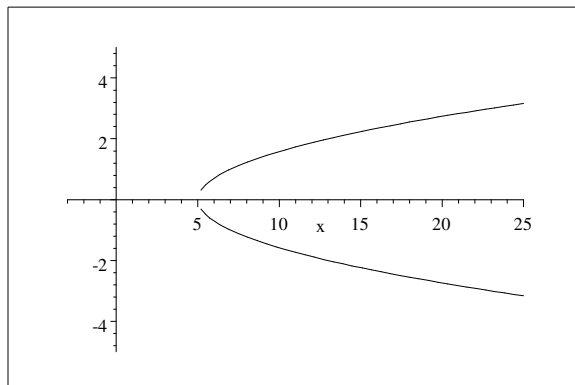


d. $x^2 - 2y = 4$, Solution is: $\{y = \frac{1}{2}x^2 - 2\}$

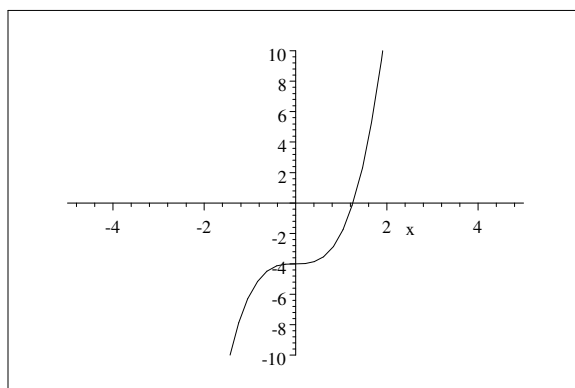


e. $2x - 4y^2 = 10$, Solution is $\{y = -\frac{1}{2}\sqrt{(2x - 10)}, \frac{1}{2}\sqrt{(2x - 10)}\}$

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f. $\frac{1}{2}y = x^3 - 2$, Solution is: $\{y = 2x^3 - 4\}$



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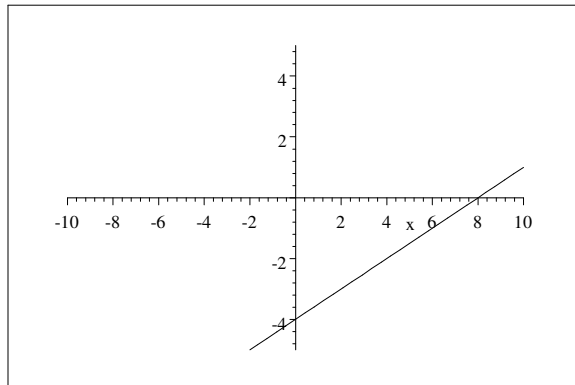
ANSWERS— Evaluating and Graphing Functions

- $f(-1) = -10$
 $f(0) = -5$
 $f(2) = -7$
- $g(-3) = -30$
 $g(0) = 0$
 $g(4) = 16$
- $h(-2) = -3$
 $h(1) = 0$
 $h(3) = 22$
- $f(-3) = -\frac{15}{2}$
 $f(0) = 15$
 $f(2) = 5$

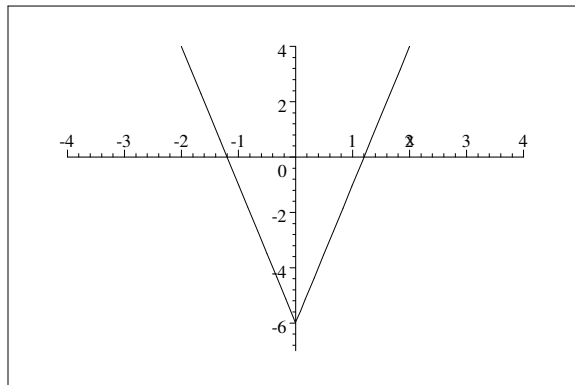
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5.

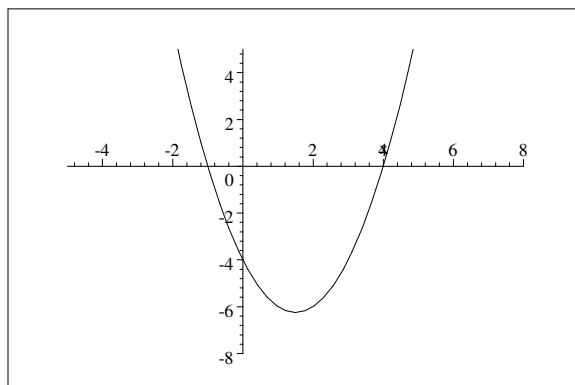
a. $f(x) = \frac{1}{2}x - 4$



b. $g(x) = 5|x| - 6$

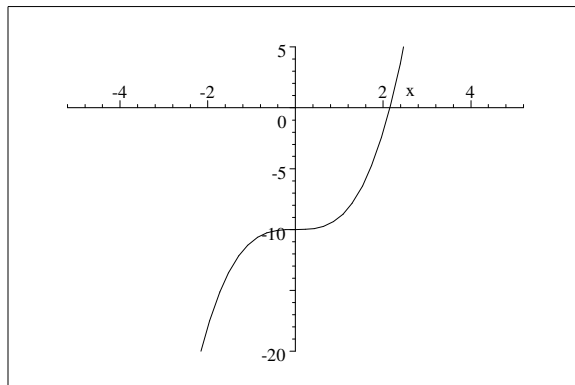


c. $h(x) = x^2 - 3x - 4$



d. $i(x) = x^3 - 10$

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6.

- a. all reals
- b. all reals
- c. all reals
- d. all real numbers except 1