The Sensei Learning System for Mastering Intermediate Algebra

I. Integer Operations Part 1 [1.1]

Simplify using the operator

1. $-1-4+5-9+8$

2. $-1+4+5-9-8$

3. $-(-2)+(-5)-(-2)$

4. $-1+(-2)-(-5)-(-2)$

5. $-9+(-2)-(-5)-(-3)$

1. $-1+5-6-7+8-9$

2. $-1-5-6+7+8-9$

3. $-(-4)+(-11)-(-6)$

4. $-1+(-5)-(-11)+(-9)$

5. $-2+(-3)-(-9)+(-2)$

1. $-9+8-7+6+1$

2. $-9+8+7+6-1$

3. $-(-7)+(-7)-(-7)$

4. $-1-7-(-3)-(-4)$

5. $-1-2-(-9)-4$

Expand and simplify [1.2]

6. 3^2

7. 3^3

8. -2^2

9. -5^3

10. $(-5)^3$

11. $(-5)^2$

12. $-(-5)^2$

6. 2^3

7. 2^2

8. -5^3

9. -2^3

10. $(-2)^3$

11. $(-2)^2$

12. $-(-2)^2$

6. 5^2

7. 5^3

8. -3^3

9. -3^3

10. $(-3)^3$

11. $(-3)^2$

12. $-(-3)^2$

Integer Operations Part 2 [2.1]

Evaluate

1.	$20 + 3(-2)(-1)$	1. $25 + 2(2)(-2)$	1. $30 + 3(-1)(2)$
2.	$20 - 3(-2)(-1)$	2. $25 - 2(2)(-2)$	2. $30 - 3(-1)(2)$
3.	$-12 + 3(-2)(-1)$	3. $-15 + 2(2)(-2)$	3. $-20 + 3(-1)(2)$
4.	$-12 - 3(-2)(-1)$	4. $-15 - 2(2)(-2)$	4. $-20 - 3(-1)(2)$
5.	$20 - 3(2)^2$	5. $25 - 2(3)^2$	5. $30 - 3(3)^2$
6.	$-20 - 3(-2)^2$	5. $-25 - 2(-3)^2$	6. $-30 - 3(-3)^2$
7.	$20 - 3(2)^2$	7. $25 - 2(3)^2$	7. $30 - 3(3)^2$
8.	$3(2)^3 - 3(2)^2$	8. $2(3)^3 - 5(3)^2$	8. $2(2)^3 - 5(2)^2$

Add, Subtracting, Multiplying Integers [2.2]

Evaluate

9. $-2(-2)^2-3(-2)^2$ 9. $-3(-1)^2-2(-2)^2$ 9. $-1(-2)^2-5(-2)^2$

10. $-2(3)^2-2(-3)^2$ 10. $-3(2)^2-3(-3)^2$ 10. $-4(2)^2-3(-2)^2$

11. $-4(3)^2-2(-3)^2$ 11. $-3(2)^2-1(-3)^2$ 11. $-4(-2)^2-3(2)^2$

12. $-4(3)^2+2(-3)^2$ 12. $-3(2)^2+1(-3)^2$ 12. $-4(-2)^2+3(2)^2$

13. $4(-2)^2-2(-3)^2$ 13. $3(-2)^2-1(-3)^2$ 13. $4(-2)^2-3(-2)^2$

Substitution and Simplifying [3.1]

Evaluate given: $x = 2,\ y = -2,\ z = 3,\ w = -3$

1. $3x^3 - 2z^2$

2. $-3x^3 - 3y^2$

3. $-3y^3 - 3z^2$

1. $4x^3 - 3z^2$

2. $-2x^3 - 2y^2$

3. $-2y^3 - 2z^2$

1. $2x^3 - 4z^2$

2. $-3x^3 - 2y^3$

3. $-y^2 - 3z^3$

Substitution and Simplifying [3.2]

valuate given: $x = 2,\ y = -2,\ z = 3,\ w = -3$

4. $-3y^3 - w^3$

4. $-2y^3 - 3w^2$

4. $-y^3 - 2w^2$

5. $-2z^2 - 2w^2$

5. $-x^2 - w^3$

5. $-3x^3 - 2z^3$

6. $y^2 - 2x^2 - 2z^2$

6. $-w^3 - z^2 - y^2$

6. $-y^2 - 3y^2 + w^2$

Substitution and Simplifying [4.1]

Solve for y given x:

1. $y = 2x^2 + 3x + 4,\ x = 1$

2. $y = 2x^2 + 3x + 4,\ x = -1$

3. $y = 2x^2 + 3x + 4,\ x = -2$

1. $y = 3x^2 + 2x + 4,\ x = 1$

2. $y = 3x^2 + 2x + 4,\ x = -1$

3. $y = 3x^2 + 2x + 4,\ x = -2$

1. $y = 3x^2 + 4x + 2,\ x = 1$

2. $y = 3x^2 + 4x + 2,\ x = -1$

3. $y = 3x^2 + 4x + 2,\ x = -2$

Solve for y given x: [4.2]

1. $y = -2x^2 + 3x + 4,\ x = 1$ 1. $y = -3x^2 + 2x + 4, x = 1$ 1. $y = -3x^2 + 4x + 2, x = 1$

2. $y = -2x^2 + 3x + 4,\ x = -1$ 2. $y = -3x^2 + 2x + 4, x = -1$ 2. $y = -3x^2 + 4x + 2, x = -1$

3. $y = -2x^2 + 3x + 4,\ x = -2$ 3. $y = -3x^2 + 2x + 4, x = -2$ 3. $y = -3x^2 + 4x + 2, x = -2$

Solve for y given x: [4.3]

1. $y = -2x^2 - 3x - 4,\ x = 1$

1. $y = -3x^2 - 2x - 4,\ x = 1$

1. $y = -3x^2 - 4x - 2,\ x = 1$

2. $y = -2x^2 - 3x - 4,\ x = -1$

2. $y = -3x^2 - 2x - 4,\ x = -1$

2. $y = -3x^2 - 4x - 2,\ x = -1$

3. $y = -x^2 + x - 10,\ x = -2$

3. $y = -x^2 + x - 1,\ x = -2$

3. $y = -x^2 + x - 5,\ x = -2$

II. Solving Linear Equations Part 1 [5.1]

Solve for x: repeat problem, show all steps

1. $x + 6 = 13$

2. $10 = x + 4$

3. $x - 4 = 10$

4. $10 = x - 4$

5. $8 + x = 10$

6. $10 = 7 + x$

1. $x + 3 = 14$

2. $12 = x + 5$

3. $x - 3 = 7$

4. $12 = x - 1$

5. $5 + x = 9$

6. $12 = 4 + x$

1. $x + 1 = 7$

2. $9 = x + 1$

3. $x - 1 = 8$

4. $9 = x - 11$

5. $9 + x = 10$

6. $9 = 7 + x$

Solve for x: repeat problem, show all steps

7. $x + 6 = -13$

8. $-10 = x + 4$

9. $x - 4 = -10$

10. $-10 = x - 4$

11. $8 + x = -10$

12. $-10 = 7 + x$

7. $x + 3 = -14$

8. $-12 = x + 5$

9. $x - 3 = -7$

10. $-12 = x - 1$

11. $5 + x = -9$

12. $-12 = 4 + x$

7. $x + 1 = -7$

8. $-9 = x + 1$

9. $x - 1 = -8$

10. $-9 = x - 11$

11. $9 + x = -10$

12. $-9 = 7 + x$

Solve for x: repeat problem, show all steps

13. $-8 + x = -10$

13. $-5 + x = -9$

13. $-9 + x = -10$

14. $-10 = -7 + x$

14. $-12 = -4 + x$

14. $-9 = -7 + x$

15. $-8 + x = -2$

15. $-5 + x = -3$

15. $-9 + x = -4$

16. $-5 = -7 + x$

16. $-3 = -4 + x$

16. $-4 = -7 + x$

17. $-8 + x = 10$

17. $-5 + x = 9$

17. $-9 + x = 10$

18. $10 = -7 + x$

18. $12 = -4 + x$

18. $9 = -7 + x$

Solve for x: repeat problem, show all steps

1. $3x = 15$	1. $7x = 14$	1. $5x = 20$
2. $36 = 9x$	2. $35 = 7x$	2. $40 = 8x$
3. $4x = -44$	3. $6x = -42$	3. $2x = -20$
4. $72 = \frac{8}{3}x$	4. $24 = \frac{3}{2}x$	4. $36 = \frac{4}{3}x$
5. $-\frac{4}{5}x = -12$	5. $-\frac{5}{3}x = -10$	5. $-\frac{3}{7}x = -12$
6. $-72 = -\frac{9}{2}x$	6. $-18 = -\frac{3}{8}x$	6. $-55 = -\frac{5}{3}x$

Solve for x: repeat problem, show all steps

7. $3x + 4 = 19$	7. $7x + 1 = 15$	7. $5x + 7 = 27$
8. $39 = 9x + 3$	8. $40 = 7x + 5$	8. $48 = 8x + 8$
9. $3x - 4 = 11$	9. $7x - 1 = 13$	9. $5x - 7 = 13$
10. $28 = 9x - 8$	10. $31 = 7x - 4$	10. $30 = 8x - 10$

Solve for x: repeat problem, show all steps

11. $3 = 1 + \frac{1}{2}x$

11. $4 = 1 + \frac{1}{3}x$

11. $5 = 1 + \frac{1}{4}x$

12. $5 = \frac{3}{2}x - 7$

12. $7 = \frac{2}{3}x - 5$

12. $13 = \frac{4}{5}x - 3$

13. $\frac{1}{2}x + 4 = 7$

13. $\frac{1}{3}x + 2 = 9$

13. $\frac{1}{4}x + 1 = 4$

Solve for x: repeat problem, show all steps

1. $5x - 5 = 3x + 7$

1. $7x - 4 = 5x + 8$

1. $4x - 8 = 2x + 4$

2. $-x - 14 = -2x - 16$

2. $-2x - 10 = -3x - 12$

2. $-3x - 16 = -4x - 18$

3. $-14 - 3x = -16 - 2x$

3. $-15 - 4x = -17 - 3x$

3. $-8 - 5x = -10 - 4x$

Solve for x: repeat problem, show all steps

4. $-16-5x=-14-4x$ 4. $-10-6x=-8-5x$ 4. $-20-4x=-18-3x$

5. $2x-5=-6x+7$ 5. $3x-4=-5x+8$ 5. $4x-7=-4x+5$

6. $-5x+13=-17-10x$ 6. $-2x+14=-16-7x$ 6. $-9x+10=-20-14x$

Solving Linear Equations Part 4 [8.1]

Solve for x: repeat problem, show all steps

1. $4x - 10 - 10x = 2 + 6x - 12$ 1. $2x - 5 - 5x = 1 + 3x - 6$ 1. $9x - 4 - 5x = 2 + 8x - 6$

2. $8 - 4x - 12 = -6x + 14 - 4x$ 2. $4 - 2x - 6 = -3x + 7 - 2x$ 2. $9 - 4x - 1 = -4x + 17 - 3x$

Solving Linear Equations Part 4 [8.2]

Solve for x: repeat problem, show all steps

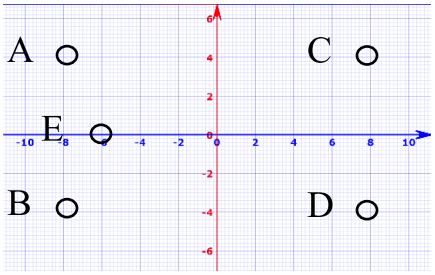
3. $-2-28+4x=14+4x-8x$ 3. $-1-14+2x=7+2x-4x$ 3. $-3-16+7x=3+5x-2x$

4. $18-4x-22=6x+14-4x$ 4. $9-2x-11=3x+7-2x$ 4. $8-7x-22=2x-3-4x$

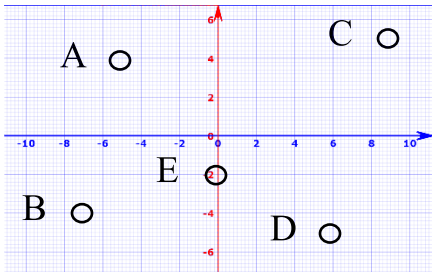
Plotting on a Coordinate Plane [9.1]

Give the coordinates for the labeled points on the graph

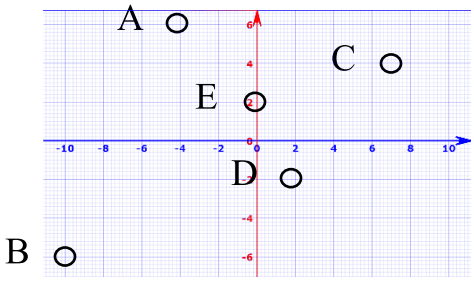
1. A(,)
B(,)
C(,)
D(,)
E(,)



1. A(,)
B(,)
C(,)
D(,)
E(,)



1. A(,)
B(,)
C(,)
D(,)
E(,)



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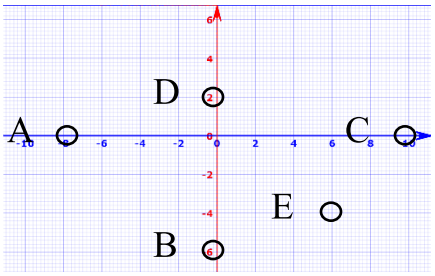
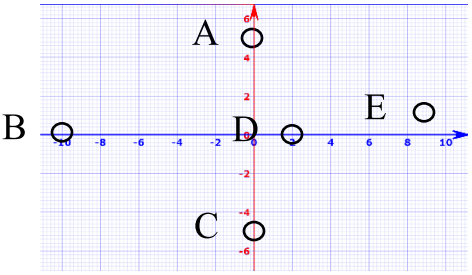
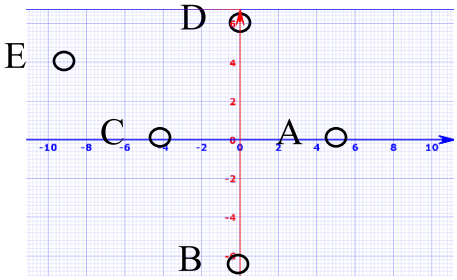
2. A(,)
B(,)
C(,)
D(,)
E(,)



2. A(,)
B(,)
C(,)
D(,)
E(,)

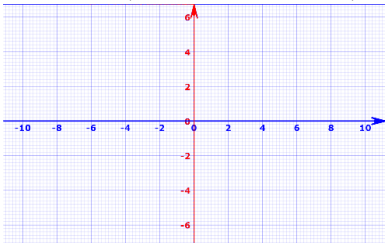


2. A(,)
B(,)
C(,)
D(,)
E(,)

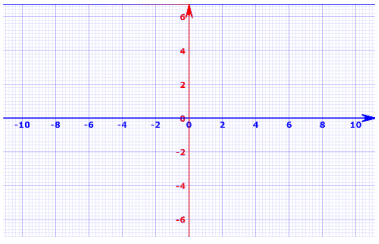


Graph and label the given coordinates

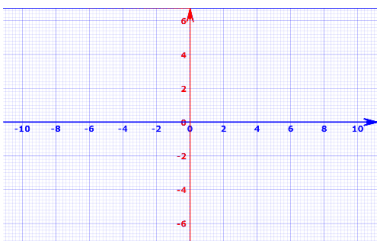
3. A(10 , 2)
B(-6 , 5)
C(5 , -6)
D(-1 , -1)
E(0 , 4)



3. A(5 , 5)
B(5 , -5)
C(-5 , -5)
D(-5 , 5)
E(0 , -2)



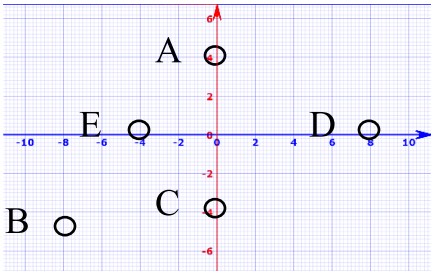
3. A(8 , 0)
B(0 , 6)
C(-8 , 0)
D(0 , -6)
E(1 , 1)



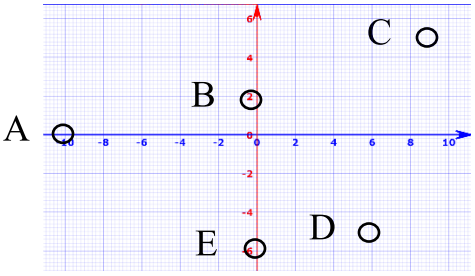
Plotting on a Coordinate Plane [9.2]

Give the coordinates for the labeled points on the graph

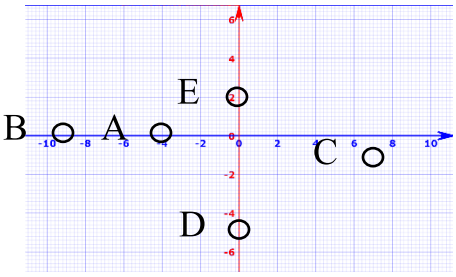
4. A(,)
B(,)
C(,)
D(,)
E(,)



4. A(,)
B(,)
C(,)
D(,)
E(,)

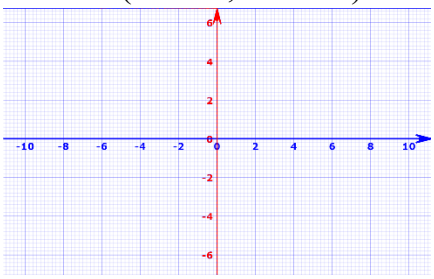


4. A(,)
B(,)
C(,)
D(,)
E(,)

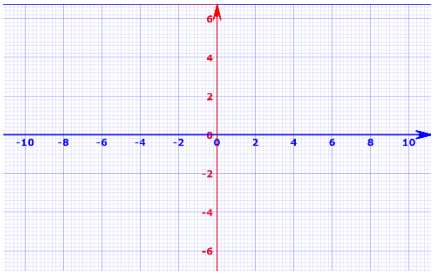


Graph and label the given coordinates

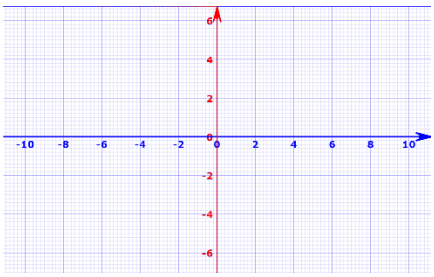
5. A(0 , 8)
B(0 , -8)
C(5 , 0)
D(-5 , 0)
E(0 , 0)



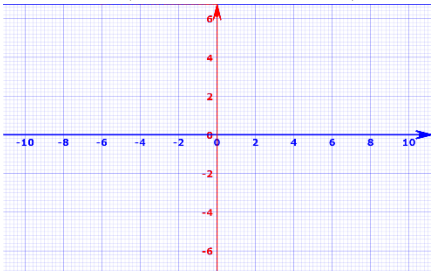
5. A(0 , 5)
B(0 , -5)
C(0 , 0)
D(-5 , 0)
E(5 , 0)



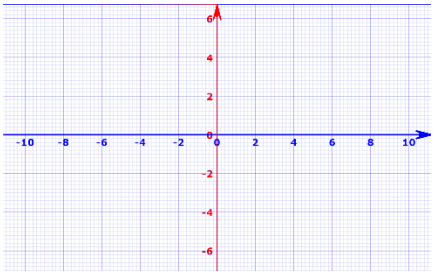
5. A(0 , 0)
B(6 , 0)
C(-6 , 0)
D(0 , 4)
E(0 , -4)



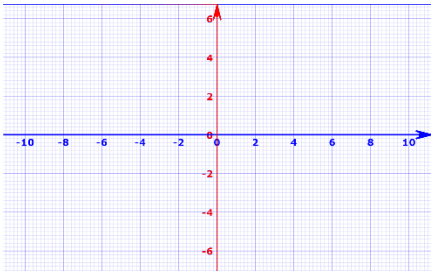
6. A(0 , 2)
B(3 , -3)
C(0 , -6)
D(-1 , 0)
E(0 , 4)



6. A(0 , 5)
B(5 , 0)
C(0 , -5)
D(-5 , 0)
E(-3 , 3)



6. A(8 , 0)
B(0 , 5)
C(-8 , 0)
D(0 , -5)
E(-3 , -3)



Graphing Linear Equations **[10.1]**

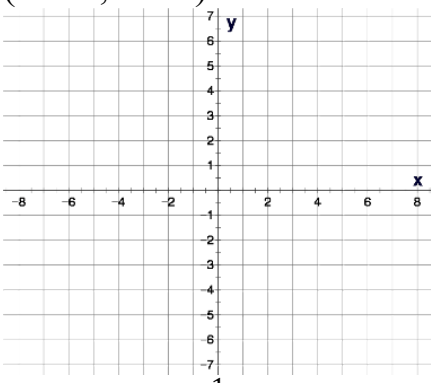
Write slope and y-intercept and graph and label points

1. $y = \frac{2}{3}x - 5$

m =

(,)

(,)

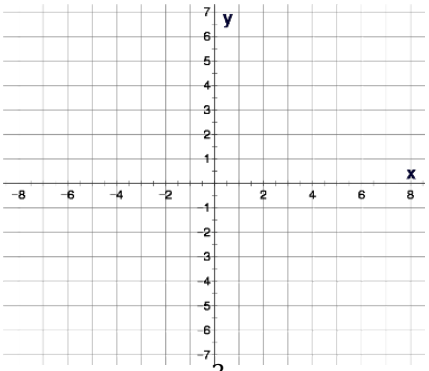


2. $y = -\frac{1}{4}x + 2$

m =

(,)

(,)

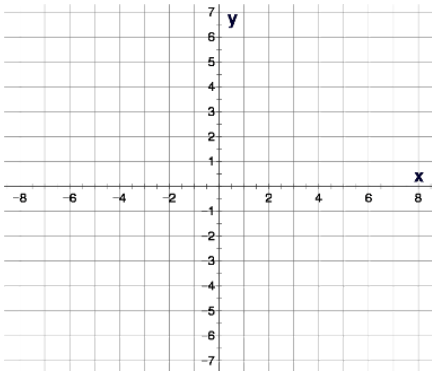


3. $y = -\frac{3}{4}x - 3$

m =

(,)

(,)

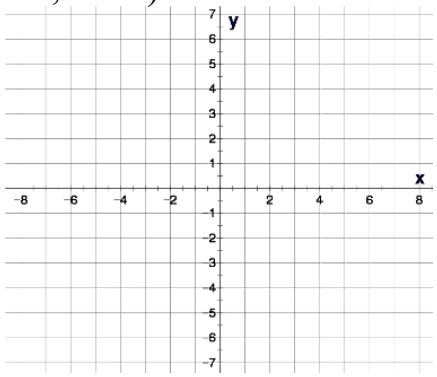


1. $y = \frac{5}{2}x - 4$

m =

(,)

(,)

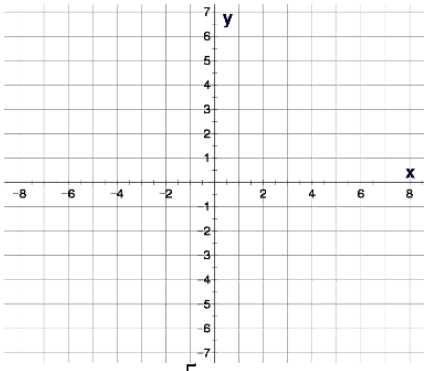


2. $y = -\frac{5}{2}x + 4$

m =

(,)

(,)

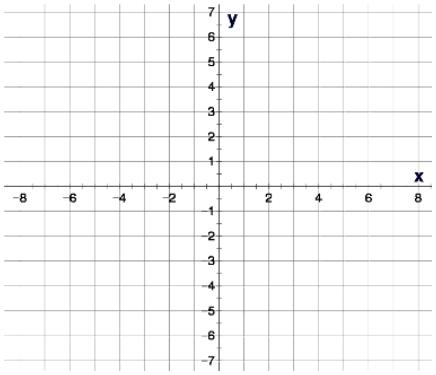


3. $y = -\frac{5}{3}x - 2$

m =

(,)

(,)

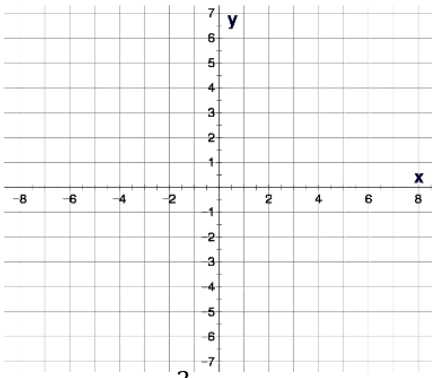


1. $y = \frac{3}{5}x - 1$

m =

(,)

(,)

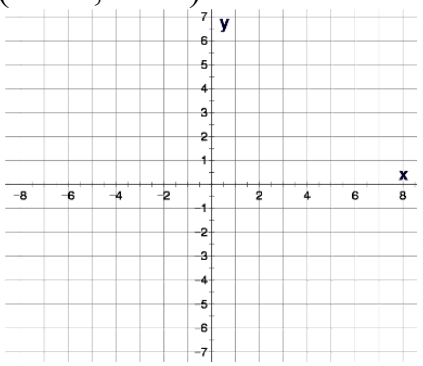


2. $y = -\frac{3}{5}x + 1$

m =

(,)

(,)

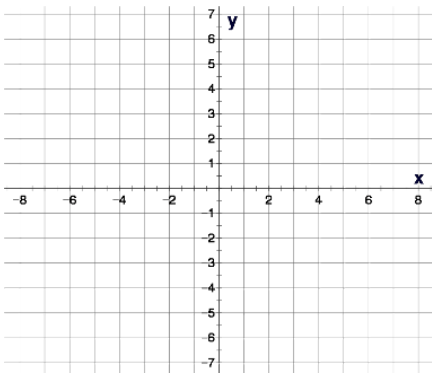


3. $y = -\frac{3}{4}x - 1$

m =

(,)

(,)



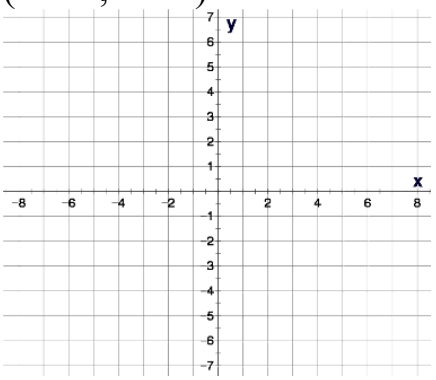
Write slope and y-intercept and graph and label points

4. $y = \frac{5}{3}x$

m =

(,)

(,)

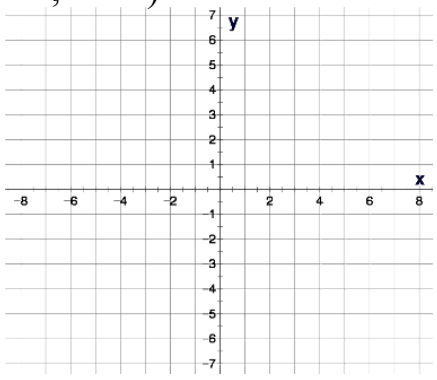


4. $y = \frac{7}{4}x$

m =

(,)

(,)

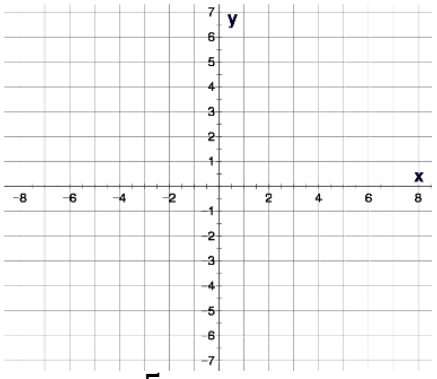


4. $y = \frac{3}{2}x$

m =

(,)

(,)

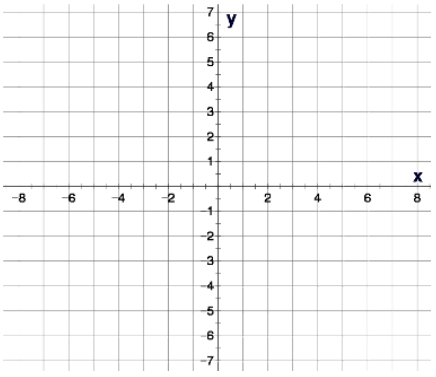


5. $y = 3x$

m =

(,)

(,)

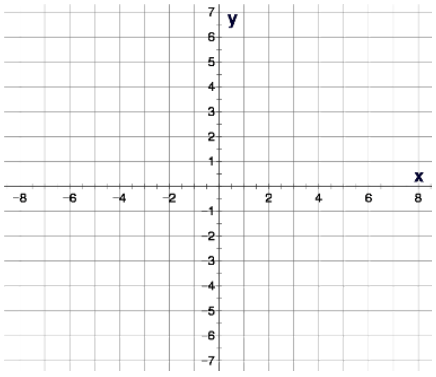


5. $y = 4x$

m =

(,)

(,)

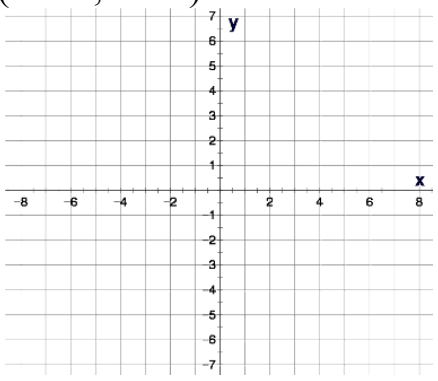


5. $y = 5x$

m =

(,)

(,)

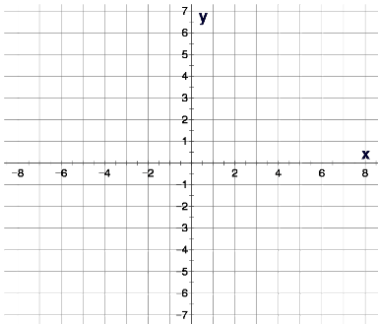


6. $y = -3x$

m =

(,)

(,)

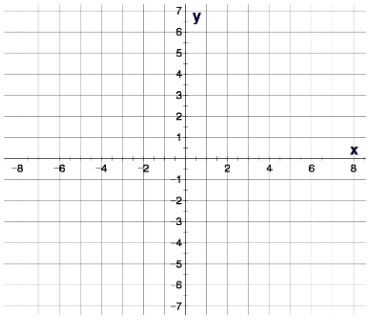


6. $y = -4x$

m =

(,)

(,)

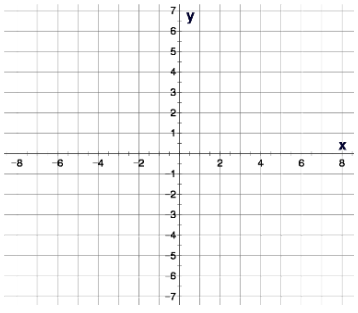


6. $y = -5x$

m =

(,)

(,)



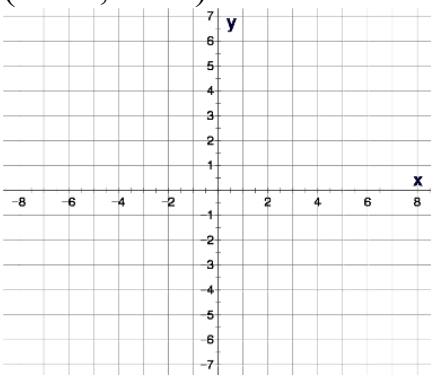
Write slope and y-intercept and graph and label points

7. $y = x - 5$

m =

(,)

(,)

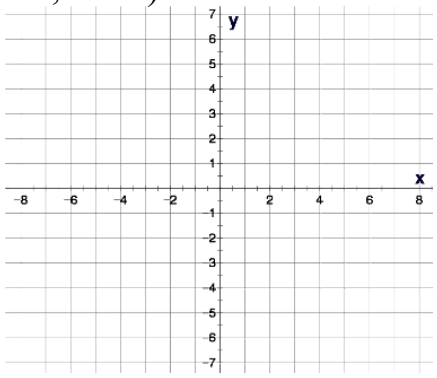


7. $y = x - 4$

m =

(,)

(,)

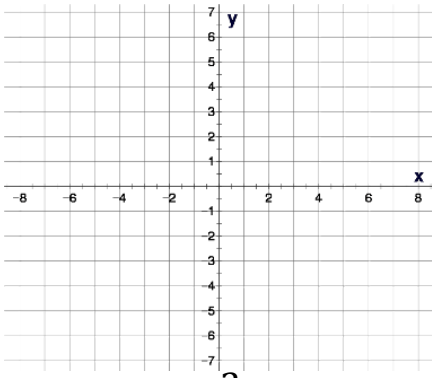


7. $y = x + 2$

m =

(,)

(,)

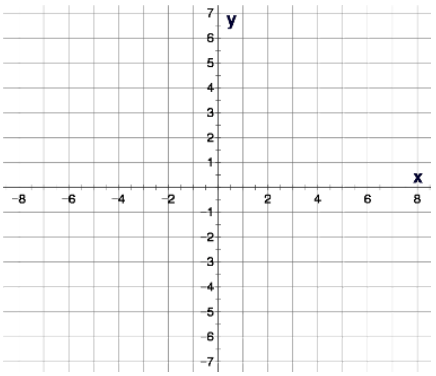


8. $y = x + 5$

m =

(,)

(,)

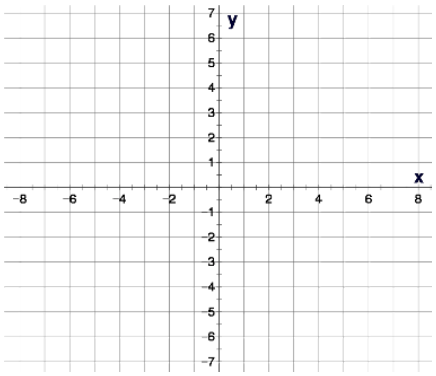


8. $y = x + 4$

m =

(,)

(,)

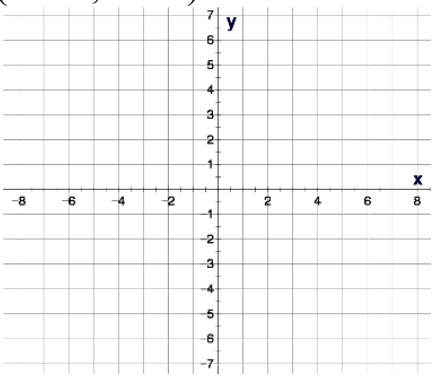


8. $y = x - 2$

m =

(,)

(,)

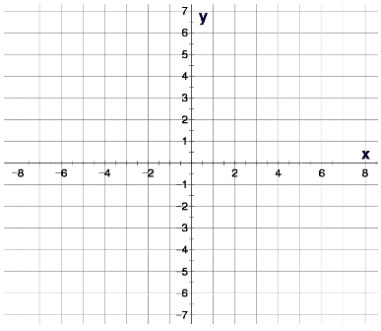


9. $y = 4 - 3x$

m =

(,)

(,)

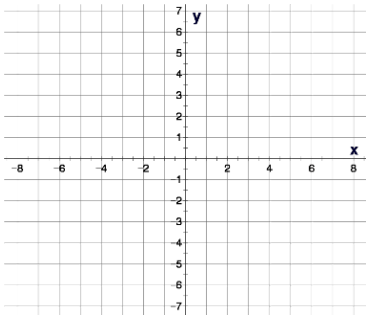


9. $y = 3 - 4x$

m =

(,)

(,)

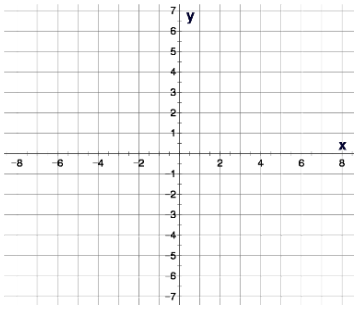


9. $y = 5 - 2x$

m =

(,)

(,)



III. Making Linear Equations Part 1 [11.1]

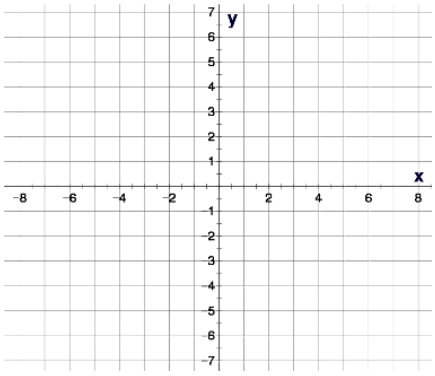
Write in slope, y-intercept form and graph

1. $2x + 3y = 15$

m =

(,)

(,)



2. $5x - 3y = 18$

m =

(,)

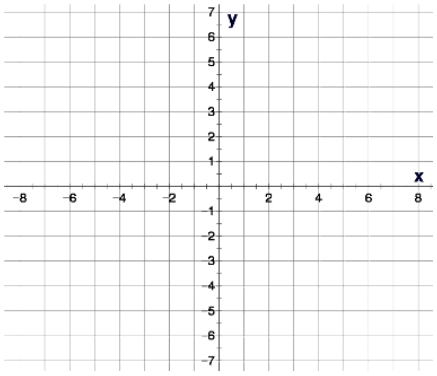
(,)

1. $3x + 4y = 12$

m =

(,)

(,)



2. $2x - 5y = 20$

m =

(,)

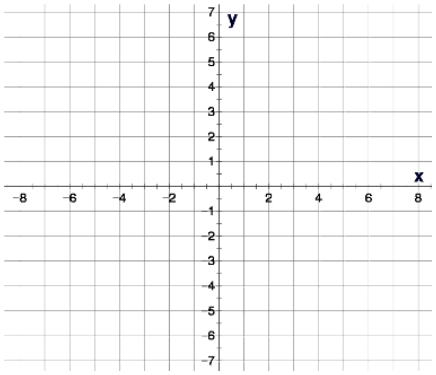
(,)

1. $-4x + 5y = -30$

m =

(,)

(,)

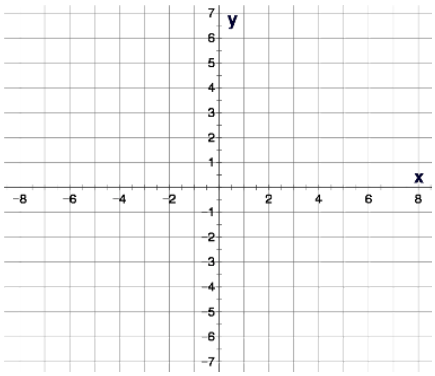


2. $4x - 3y = 18$

m =

(,)

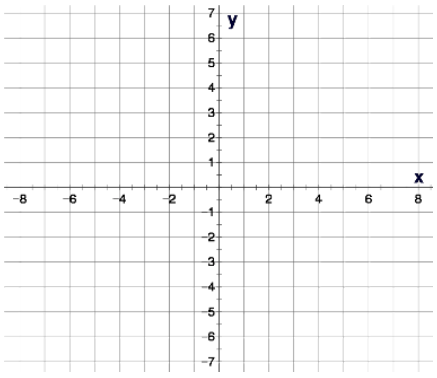
(,)



m =

(,)

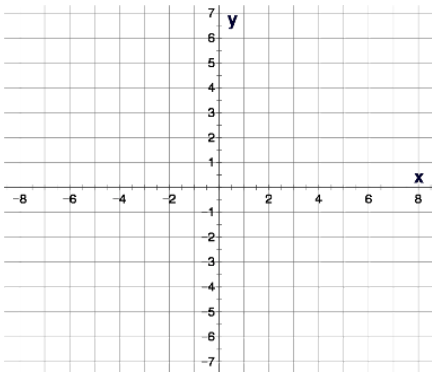
(,)



m =

(,)

(,)



Making Linear Equations Part 1 [11.2]

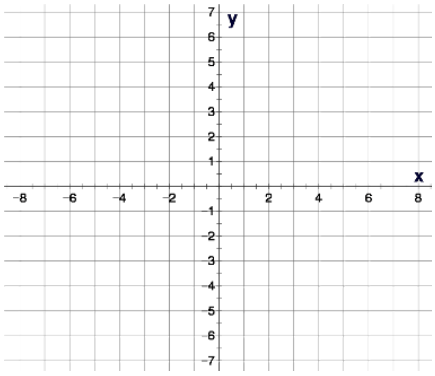
Write in slope, y-intercept form and graph

3. $-8x-3y=-18$

m =

(,)

(,)



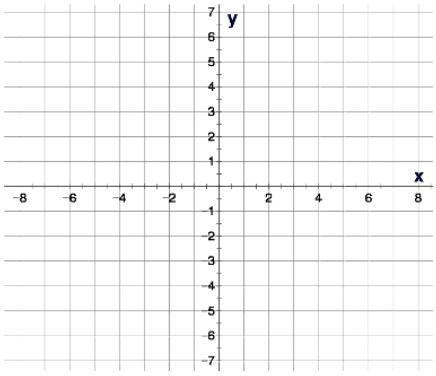
4. $-6x+8y=-24$

3. $-5x-4y=-24$

m =

(,)

(,)



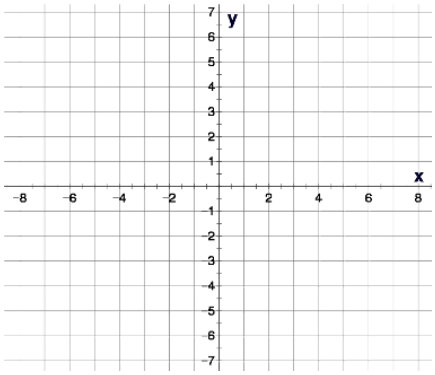
4. $-2x+5y=-20$

3. $-4x-5y=-40$

m =

(,)

(,)

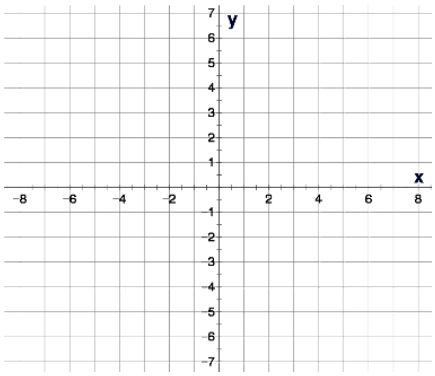


4. $-4x+7y=-21$

m =

(,)

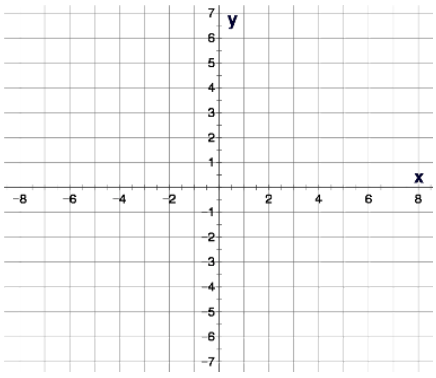
(,)



m =

(,)

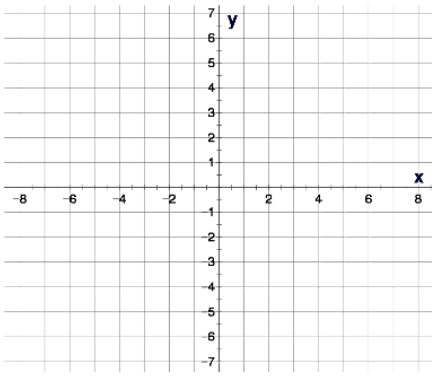
(,)



m =

(,)

(,)



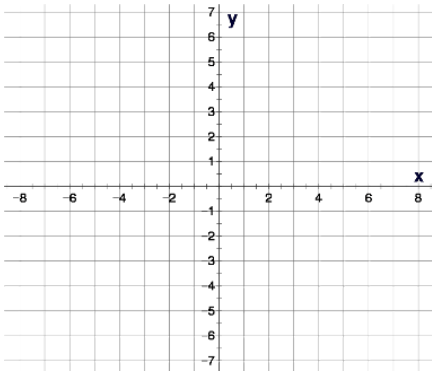
Write in slope, y-intercept form and graph

5. $8x + 3y = 18$

m =

(,)

(,)

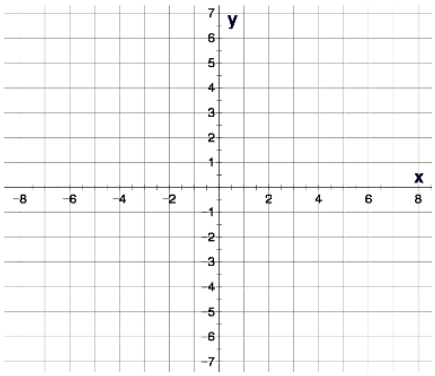


6. $6x - 8y = 24$

m =

(,)

(,)

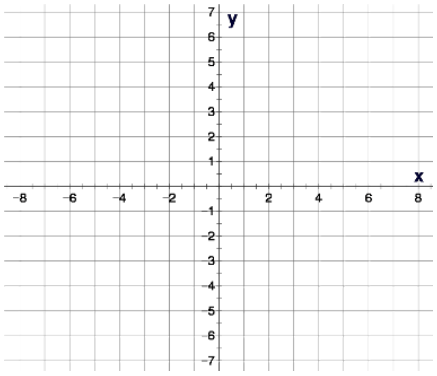


5. $5x + 4y = 24$

m =

(,)

(,)

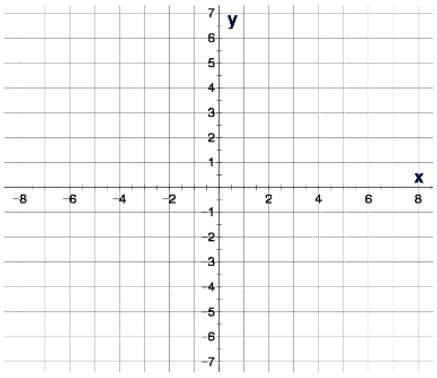


6. $2x - 5y = 20$

m =

(,)

(,)

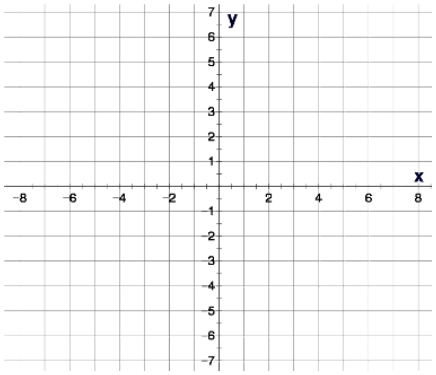


5. $4x + 5y = 40$

m =

(,)

(,)

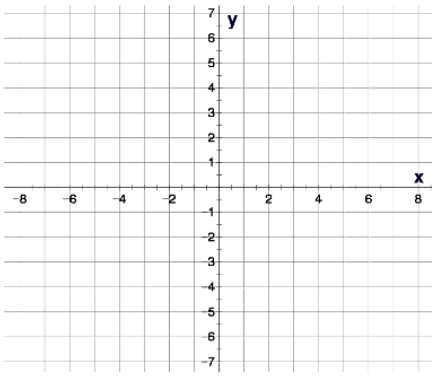


6. $4x - 9y = 27$

m =

(,)

(,)



Find the slope using the slope formula:

1. (3 , 5)
   (1 , 2)

1. (4 , 7)
   (1 , 3)

1. (4 , 8)
   (2 , 5)

2. (-3 , -5)
   (-1 , -2)

2. (-4 , -7)
   (-2 , -3)

2. (-5 , -9)
   (-2 , -4)

3. (-3 , 5)
   (1 , -2)

3. (-4 , 4)
   (2 , -3)

3. (-5 , 6)
   (2 , -4)

4. (-3 , -5)
   (5 , -7)

4. (-4 , -4)
   (10 , -8)

4. (-1 , -1)
   (3 , -4)

Find the slope using the slope formula:

5. (3 , -5)
(-1 , 2)

5. (-4 , -7)
(-2 , 3)

5. (5 , -1)
(-2 , -2)

6. (3 , -5)
(-1 , -2)

6. (4 , -7)
(-2 , -3)

6. (-3 , -2)
(-2 , 4)

7. (-3 , -5)
(-1 , -2)

7. (-4 , 7)
(-2 , -3)

7. (-3 , -2)
(-2 , 4)

8. (4 , -8)
(-8 , -2)

8. (-5 , -7)
(-7 , 3)

8. (-3 , -7)
(-9 , -4)

Find the slope intercept equation:

1. (8 , 2)
   (4 , -4)

2. (-4 , -7)
   (-8 , -8)

1. (4 , 1)
   (2 , -2)

$y = \frac{3}{2}x - 5$

2. (-5 , -5)
   (10 , -14)

$y = -\frac{3}{5}x - 8$

1. (-3 , 12)
   (3 , 4)

$y = -\frac{4}{3}x + 8$

2. (10 , -3)
   (-5 , 3)

$y = -\frac{2}{5}x + 1$

Find the slope intercept equation:

3. (-6 , -13)
(6 , -7)

3. (-2 , -11)
(2 , -9)

3. (-4 , 10)
(4 , 4)

$y = \frac{1}{2}x - 10$

4. (-3 , 6)
(3 , -4)

4. (-2 ,-17)
(4 , -2)

4. (1 , -3)
(3 , -13)

$y = \frac{5}{2}x - 12$

Find a parallel and perpendicular equation through the given point:

1. $\|: y = 2x - 5 \quad (2, 3)$

$$y = 3x - 13$$

2. $\|: y = \frac{2}{3}x - 1 \ (-3, -1)$

1. $\|: y = 3x - 2 \quad (2, 3)$

2. $\|: y = \frac{3}{4}x - 2 \quad (-4, -1)$

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

1. $\|: y = 4x - 3 \quad (2, 3)$

2. $\|: y = \frac{2}{5}x - 3 \ (-5, 1)$

Find a parallel and perpendicular equation through the given point:

3. $\|: y = -x + 2 \ (-4, 3)$ 3. $\|: y = -x + 3 \ (-5, 3)$ 3. $\|: y = -x + 4 \ (-6, 5)$

$$y = -x - 2$$

4. $\|: y = -\frac{2}{3}x + 2 \ (6, -5)$ 4. $\|: y = -\frac{3}{2}x + 3 \ (6, -5)$ 4. $\|: y = -\frac{5}{6}x + 1 \ (6, -7)$

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

Find a parallel and perpendicular equation through the given point:

4. $\perp: y = -\frac{2}{3}x + 2 \ (-6, -7)$ 4. $\perp: y = -\frac{3}{2}x + 1 \ (-6, -3)$ 4. $\perp: y = -\frac{3}{5}x + 3 \ (-6, -5)$

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

5. $\perp: y = 2x - 5 \quad (2, 1)$ 5. $\perp: y = 3x - 1 \quad (3, 2)$ 5. $\perp: y = 4x - 3 \quad (4, 3)$

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

Find a parallel and perpendicular equation through the given point:

6. $\perp: y = \frac{2}{3}x - 1 \ (-4, 10)$ 6. $\perp: y = \frac{5}{3}x - 4 \quad (-10, 8)$ 6. $\perp: y = \frac{2}{5}x - 7 \ (-6, 10)$

$$y = -\frac{3}{5}x + 2$$

7. $\perp: y = x + 2 \ (-5, -1)$ 7. $\perp: y = x + 4 \quad (-6, -2)$ 7. $\perp: y = x - 7 \ (-7, -3)$

$$y = -1x$$

8. $\perp: y = -x + 2 \ (-5, -1)$ 8. $\perp: y = -x + 4 \quad (-6, -2)$ 8. $\perp: y = -x - 7 \ (-7, -3)$

IV. Operations on Monomials [15.1]

Simplify using the operator

1. $x + x$

2. $x \cdot x$

3. $3x^3 + 2x^2 + x^3 + x^2$

4. $-3x^3 + 2x^2 + x^3 + x^2$

5. $3x^2 + 2x + x + 5$

6. $x^2 - 6x - x - 9$

1. $x + x + x$

2. $x \cdot x \cdot x$

3. $4x^4 + 3x^3 + x^4 + x^3$

4. $-4x^4 + 3x^3 + x^4 - x^3$

5. $5x^2 - 2x + x - 7$

6. $x^2 - x + 8x + 12$

1. $x + x + x + x$

2. $x \cdot x \cdot x \cdot x$

3. $4x^5 + 3x^3 + x^5 + x^3$

4. $-4x^5 + 3x^3 - x^5 - x^3$

5. $4x^2 - 3x + x - 6$

6. $x^2 - x - 4x - 5$

Simplify using the operator

7. $4x^4 + 3x^2 + x^2 + 3$

7. $6x^4 - 3x^2 + x^2 - 15$

7. $x^4 - x^2 + 8x^2 - 16$

8. $2x^4 - x^2 - x^2 + 3$

8. $3x^4 - 3x^2 + x^2 - 15$

8. $x^4 - x^2 - 8x^2 - 6$

9. $(2x)(3x)$

9. $(4x^2)(3x)$

9. $(5x^3)(7x)$

10. $(-4x)(-x)$

10. $(5x^3)(-x)$

10. $(-4x^3)(-3x)$

11. $(5x)(-3x^2)$

11. $(-3x)(-3x^3)$

11. $(-x^4)(-x)$

Multiplying Polynomials Part 1 [16.1]

Multiply using distribution

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

2. $x(x^2 - 2x - 3)$

3. $6x^2(x^2 - 2x - 3)$

4. $6x(-x^2 + 2x - 4)$

1. $3(2x^2 + 15x - 1)$

2. $x(2x^2 + 15x - 1)$

3. $4x^3(2x^2 + 15x - 1)$

4. $2x^2(-2x^3 - 5x + 1)$

1. $4(x^3 - 10x^2 + 6x - 1)$

2. $x(x^3 - 10x^2 + 6x - 1)$

3 . $2x^4(10x^2 - 6x + 1)$

4. $3x^2(-x^4 + 5x^2 - 1)$

Multiplying Polynomials Part 1 [16.2]

Multiply using distribution

5.– $(x^3 - 10x^2 + 6x - 1)$ 5. $-2(x^3 - 10x^2 + 6x + 1)$ 5.– $3(x^3 - 10x^2 + 6x + 1)$

6.– $3(-x^4 + 5x^3 + 2x - 1)$ 6.– $(-x^4 + 5x^3 + 2x - 1)$ 6.– $5(-x^4 + 5x^3 + 2x - 1)$

7.– $6x(-x^4 - 5x^3 + 2x - 1)$ 7.– $7x(-x^4 - 5x^3 + 2x - 1)$ 7.– $8x(-x^4 - 5x^3 + 2x - 1)$

8.– $5x^2(-x^4 - 5x^3 + 2x - 1)$ 8.– $5x^3(-x^4 - 5x^3 + 2x - 1)$ 8.– $3x^5(-x^4 - 5x^3 + 2x - 1)$

Multiply binomials using F.O.I.L.

1. $(3x + 5)(x + 4)$

2. $(5x + 3)(x - 2)$

3. $(3x - 5)(x + 4)$

4. $(5x - 3)(x - 2)$

5. $(x + 3)(x + 3)$

1. $(2x + 5)(x + 2)$

$2x^2 + 9x + 10$

2. $(3x + 2)(x - 4)$

$3x^2 - 10x - 8$

3. $(3x - 5)(x + 2)$

$3x^2 + 1x - 10$

4. $(7x - 2)(x - 4)$

$7x^2 - 30x + 8$

5. $(x + 8)(x + 8)$

$x^2 + 16x + 64$

1. $(3x + 5)(4x + 5)$

2. $(7x + 4)(x - 4)$

3. $(3x - 5)(x + 5)$

4. $(x - 11)(x - 11)$

5. $(x + 7)(x + 7)$

6. $(5x - 8)(5x - 8)$

6. $(2x - 9)(2x - 9)$

6. $(3x - 4)(3x - 4)$

Multiply conjugates using F.O.I.L.$4x^2 - 36x + 81$

7. $(x + 2)(x - 2)$

7. $(x + 5)(x - 5)$

7. $(x + 4)(x - 4)$

$x^2 - 25$

8. $(5x + 3)(5x - 3)$

8. $(2x - 7)(2x + 7)$

8. $(7x - 4)(7x + 4)$

$4x^2 - 49$

9. $(x^2 + 9)(x^2 - 9)$

9. $(x^2 + 11)(x^2 - 11)$

9. $(x^2 - 12)(x^2 + 12)$

$x^4 - 121$

10. $(2x^2 + 1)(2x^2 - 1)$

10. $(3x^2 - 5)(3x^2 + 5)$

10. $(4x^2 + 7)(4x^2 - 7)$

$9x^4 - 25$

11. $(x + 8)^2$

11. $(x + 3)^2$

$x^2 + 6x + 9$

11. $(x + 4)^2$

12. $(x - 11)^2$

12. $(x - 12)^2$

$x^2 - 24x + 144$

12. $(x - 10)^2$

13. $(5x + 8)^2$

13. $(2x + 3)^2$

$4x^2 + 12x + 9$

13. $(3x + 4)^2$

14. $(2x^2 - 9)^2$

14. $(3x^2 - 4)^2$

$9x^4 - 24x^2 + 16$

14. $(4x^2 - 5)^2$

15. $(2x^3 + 11)^2$

15. $(3x^3 + 8)^2$

$9x^6 + 48x^3 + 64$

15. $(4x^2 + 1)^2$

Factoring Polynomials Part 1 [18.1]

Factor out the GCF

1. $12x^2 - 10x - 4$

2. $24x^3 - 28x^2 - 20x$

3. $18x^5 + 36x^3 + 27x^2$

4. $14x^6 - 35x^3 + 7x^2$

1. $15x^2 + 3x - 6$

2. $24x^3 - 12x^2 - 18x$

3. $20x^5 + 36x^3 + 28x^2$

4. $18x^6 - 27x^5 + 9x^2$

1. $30x^2 + 35x - 25$

2. $12x^5 - 8x^4 - 24x$

3. $20x^5 + 15x^4 + 45x^2$

4. $15x^6 - 35x^4 + 5x^2$

Factoring Polynomials Part 1 [18.2]

Factor out the GCF

5. $-8x^3-10x$

5. $-18x^4-32x$

5. $-28x^5-20x$

6. $-24x^3-28x^2-20x+4$

6. $-14x^4+35x^3-21x^2+7$

6. $-12x^5+8x^4+24x^3-4$

7. $-15x^5+10x^4-5x^3$

7. $-12x^5+15x^4-3x^3$

7. $-27x^6-9x^5+9x^3$

8. $-4x^4-8x^3+10x^2$

8. $-12x^5-18x^4+12x^3$

8. $-24x^6-16x^5+12x^4$

Factor into 2 binomials

1. $2x^2 + 5x + 2$

2. $5x^2 - 12x + 4$

3. $3x^2 + 5x - 2$

4. $6x^2 - 7x - 3$

1. $2x^2 + 7x + 3$

2. $3x^2 - 8x + 4$

3. $2x^2 + x - 3$

4. $6x^2 - 13x - 5$

1. $2x^2 + 5x + 3$

2. $3x^2 - 13x + 4$

3. $2x^2 + 5x - 3$

4. $6x^2 - 7x - 5$

Factor into 2 binomials

5. $5x^2 + 16x + 3$

5. $7x^2 + 15x + 2$

$(7x + 1)(x + 2)$

5. $7x^2 + 9x + 2$

6. $2x^2 - 7x + 3$

6. $5x^2 - 11x + 2$

$(5x - 1)(x - 2)$

6. $5x^2 - 7x + 2$

7. $5x^2 + 14x - 3$

7. $5x^2 + 2x - 3$

$(5x - 3)(x + 1)$

7. $5x^2 - 2x - 3$

8. $6x^2 - 13x - 5$

8. $6x^2 + 13x - 5$

$(3x - 1)(2x + 5)$

8. $6x^2 + 7x - 5$

Factor into 2 binomials

9. $x^2 + 5x + 6$

9. $x^2 + 7x + 6$

9. $x^2 + 5x + 4$

10. $x^2 - 9x + 8$

10. $x^2 - 6x + 8$

10. $x^2 - 5x + 6$

11. $x^2 + x - 12$

11. $x^2 + 4x - 12$

11. $x^2 - 11x - 12$

12. $x^2 - 14x - 15$

12. $x^2 + 2x - 15$

12. $x^2 + 14x - 15$

Factor binomials into conjugates

13. $16x^2 - 25$

13. $4x^2 - 9$

13. $25x^2 - 49$

14. $121x^2 - 225$

14. $4x^2 - 81$

14. $81x^2 - 36$

15. $81x^4 - 1$

15. $49x^4 - 64$

15. $64x^4 - 1$

16. $16x^6 - 169$

16. $9x^6 - 196$

16. $81x^6 - 225$

V. Solving Quadratic Equations Part 1 [20.1]

Solve quadratic equations by factoring

1. $3x^2 + 8x + 5 = 0$

$x = -\frac{5}{2}$ $x = -1$

2. $5x^2 - 8x + 3 = 0$

$x = \frac{7}{3}$ $x = 1$

3. $2x^2 + 5x - 3 = 0$

$x = \frac{2}{3}$ $x = -1$

1. $2x^2 + 7x + 5 = 0$

2. $3x^2 - 10x + 7 = 0$

3. $3x^2 + x - 2 = 0$

1. $3x^2 + 16x + 5 = 0$

2. $5x^2 - 16x + 3 = 0$

3. $2x^2 + 5x + 3 = 0$

Solving Quadratic Equations Part 1 [20.2]

Solve for x by factoring

4. $6x^2 - 4x - 2 = 0$

4. $6x^2 - 2x - 4 = 0$

4. $4x^2 - 14x + 10 = 0$

$x = -\frac{2}{3},\ x = 1$

5. $x^2 + 5x + 6$

5. $x^2 + 7x + 6$

5. $x^2 + 5x + 4$

$x = -1,\ x = -6$

6. $x^2 - 9x + 8$

6. $x^2 - 6x + 8$

6. $x^2 - 5x + 6$

$x = 4,\ x = 2$

Solve for x by factoring

7. $4x^2 - 25 = 0$

7. $9x^2 - 16 = 0$

7. $16x^2 - 49 = 0$

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

8. $121x^2 - 225 = 0$

8. $144x^2 - 169 = 0$

8. $81x^2 - 196 = 0$

$x = -\frac{13}{12}$ $x = \frac{13}{12}$

9. $16x^2 - 225 = 0$

9. $225x^2 - 9 = 0$

9. $25x^2 - 256 = 0$

Solving Quadratic Equations Part 2 [21.1]

Solve by using the Quadratic Formula

1. $3x^2 + 8x + 5 = 0$

a = b = c =

$x = \frac{-(\quad) \pm \sqrt{(\quad)^2 - 4(\quad)(\quad)}}{2(\quad)}$

1. $3x^2 + 10x + 3 = 0$

a = b = c =

$x = \frac{-(\quad) \pm \sqrt{(\quad)^2 - 4(\quad)(\quad)}}{2(\quad)}$

1. $3x^2 + 7x + 2 = 0$

a = b = c =

$x = \frac{-(\quad) \pm \sqrt{(\quad)^2 - 4(\quad)(\quad)}}{2(\quad)}$

$x = -\frac{1}{3}$ $x = -3$

Solving Quadratic Equations Part 2 [21.2]

Solve by using the Quadratic Formula

2. $2x^2 - 5x = 0$

a = b = c =

$x = \frac{-(\quad) \pm \sqrt{(\quad)^2 - 4(\quad)(\quad)}}{2(\quad)}$

2. $3x^2 - 5x = 0$

a = b = c =

$x = \frac{-(\quad) \pm \sqrt{(\quad)^2 - 4(\quad)(\quad)}}{2(\quad)}$

2. $2x^2 - 3x = 0$

a = b = c =

$x = \frac{-(\quad) \pm \sqrt{(\quad)^2 - 4(\quad)(\quad)}}{2(\quad)}$

$x = \frac{5}{3}$ $x = 0$

Solving Quadratic Equations Part 2 [21.3]

Solve by using the Quadratic Formula

3. $16x^2 - 25 = 0$

a = b = c =

$x = \frac{-(\quad) \pm \sqrt{(\quad)^2 - 4(\quad)(\quad)}}{2(\quad)}$

3. $25x^2 - 16 = 0$

a = b = c =

$x = \frac{-(\quad) \pm \sqrt{(\quad)^2 - 4(\quad)(\quad)}}{2(\quad)}$

3. $9x^2 - 49 = 0$

a = b = c =

$x = \frac{-(\quad) \pm \sqrt{(\quad)^2 - 4(\quad)(\quad)}}{2(\quad)}$

$x = \frac{4}{5}$ $x = -\frac{4}{5}$

Solving Quadratic Equations Part 2 [21.4]

Solve by using the Quadratic Formula

4. $x^2 - 6x - 7 = 0$

a = b = c =

$x = \frac{-(\quad) \pm \sqrt{(\quad)^2 - 4(\quad)(\quad)}}{2(\quad)}$

4. $x^2 - 2x - 3 = 0$

a = b = c =

$x = \frac{-(\quad) \pm \sqrt{(\quad)^2 - 4(\quad)(\quad)}}{2(\quad)}$

4. $x^2 - 4x - 12 = 0$

a = b = c =

$x = \frac{-(\quad) \pm \sqrt{(\quad)^2 - 4(\quad)(\quad)}}{2(\quad)}$

$x = 3$ $x = -1$

Solving Quadratic Equations Part 2 [21.5]

Solve by using the Quadratic Formula

5. $4x^2 - 11x - 3 = 0$

a = b = c =

$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$

5. $2x^2 + 9x - 5 = 0$

a = b = c =

$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$

5. $3x^2 - 10x - 8 = 0$

a = b = c =

$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$

$x = \frac{1}{2}$ $x = -5$

Solve by Completing the Square

1. $x^2 - 8x + 7 = 0$

1. $x^2 - 10x + 24 = 0$

$x = 6$ $x = 4$

1. $x^2 - 6x + 5 = 0$

Solve by Completing the Square

2. $x^2 + 10x + 21 = 0$

2. $x^2 + 12x + 35 = 0$

$x = -7$ $x = -5$

2. $x^2 + 14x + 40 = 0$

Solve by Completing the Square

3. $x^2 - 3x - 4 = 0$

3. $x^2 - 5x - 6 = 0$

$x = -1$ $x = 6$

3. $x^2 - 7x - 30 = 0$

Solve by Completing the Square

4. $x^2 - 9x + 8 = 0$

4. $x^2 - 7x + 6 = 0$

$x = 6$ $x = 1$

4. $x^2 - 11x + 30 = 0$

Solve by Completing the Square

5. $x^2 + 11x - 12 = 0$

5. $x^2 + 9x - 10 = 0$

$x = -10 \quad x = 1$

5. $x^2 + 7x - 18 = 0$

Inequalities [23.1]

Convert inequalities to and from set notation, graph, and interval notation

1. $x \leq 5$

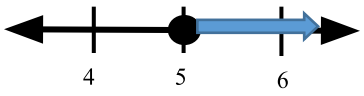
Graph:

Interval N:

2. $x > -4$

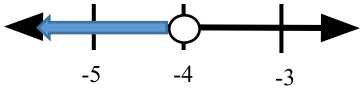
Graph:

Interval N:

3. 

Set Notation

Interval N:

4. 

Set Notation:

Interval N:

1. $x \geq 5$

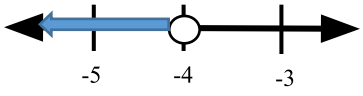
Graph:

Interval N:

2. $x \leq -17$

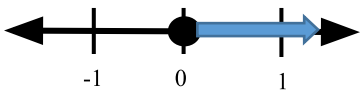
Graph:

Interval N:

3. 

Set Notation

Interval N:

4. 

Set Notation

Interval N:

1. $x < 5$

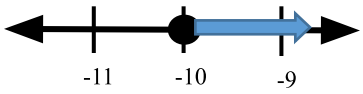
Graph:

Interval N:

2. $x > -9$

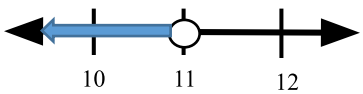
Graph:

Interval N:

3. 

Set Notation:

Interval N:

4. 

Set Notation:

Interval N:

Inequalities [23.2]

Convert inequalities to and from set notation, graph, and interval notation

5. $[2, \infty)$

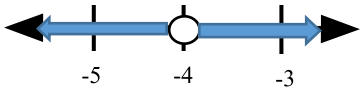
Graph:

Set Notation:

6. $(-\infty, -4)$

Graph:

Set Notation:

7. 

Set Notation:

Interval N:

8. 

Set Notation

Interval N:

5. $(-\infty, 4)$

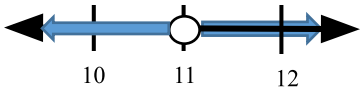
Graph:

Set Notation:

6. $(-\infty, 0]$

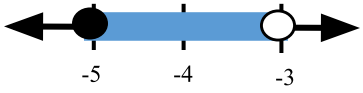
Graph:

Set Notation:

7. 

Set Notation

Interval N:

8. 

Set Notation

Interval N:

5. $(-3, \infty)$

Graph:

Set Notation:

6. $(-\infty, 10]$

Graph:

Set Notation:

7. $(-\infty, 2) \cup (2, \infty)$

Graph:

Set Notation:

8. $(-5, 2)$

Graph:

Set Notation:

Solve for x:

1. $x + 6 < 13$

2. $13 \leq x - 4$

3. $-x + 3 > -11$

1. $x - 8 > -15$

$x > -7$

$(-7, \infty)$

2. $14 \geq x - 8$

$x > 22$

$(-\infty, 22]$

3. $-x - 5 \geq -14$

$x \leq 9$

$(-\infty, 9]$

1. $x + 11 \leq -9$

2. $-1 < x + 15$

3. $-x + 12 < 21$

Solve for x:

4. $-24 \geq -13 - x$

5. $10 - x \geq -13$

6. $-14 < -x - 10$

4. $-16 > -12 - x$

$x > 4$

$(4, \infty)$

5. $22 - x > -12$

$x < 34$

$(-\infty, 34)$

6. $16 \leq -x + 17$

$x \leq 1$

$(-\infty, 1]$

4. $19 \leq 23 - x$

5. $-9 \leq -20 - x$

6. $-19 > -23 - x$

Solve for x:

1. $2 < x + 6 \leq 13$

2. $4 \leq 2x - 8 < 10$

3. $1 < \frac{x-5}{2} < 3$

1. $-15 \leq x - 8 \leq 18$

$-7 \leq x \leq 26$ $[-7, 26]$ -7 26

2. $13 \leq 3x - 8 < 19$

$7 \leq x < 9$ $[7, 9)$ 7 9

3. $-2 < \frac{x+3}{3} \leq 5$

$-9 < x \leq 12$ $(-9, 12]$ -9 12

1. $-4 < x + 1 \leq 1$

2. $-5 < 5x + 15 < 20$

3. $-8 < \frac{x-2}{4} \leq -1$

Solve for x:

4. $|2x + 6| < 10$

$-8 \leq x \leq 4$ $[-8, 4]$  −8 4

4. $|3x + 6| \leq 18$

4. $|2x - 6| < 10$

5. $|3x - 9| \leq 12$

5. $|2x - 19| < 11$

$4 < x < 15$ $(4, 15)$  4 15

5. $|4x + 6| \leq 10$

Solve for x:

6. $|x + 6| > 5$

6. $|x + 7| > 9$

$x < -16 \text{ or } x > 2$ $(-\infty, -16) \cup (2, \infty)$

6. $|x - 9| \geq 12$

7. $|4x - 6| \geq 14$

7. $|2x - 7| \geq 19$

$x \leq -6 \text{ or } x \geq 13$ $(-\infty, -6] \cup [13, \infty)$

7. $|3x + 9| \geq 12$

Solve for x:

8. $|3x + 27| \leq 12$

9. $|2x + 10| > 10$

8. $|2x + 19| < 11$

9. $|3x + 18| \geq 18$

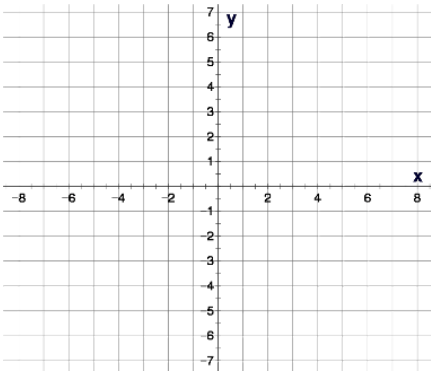
8. $|4x + 6| \leq 2$

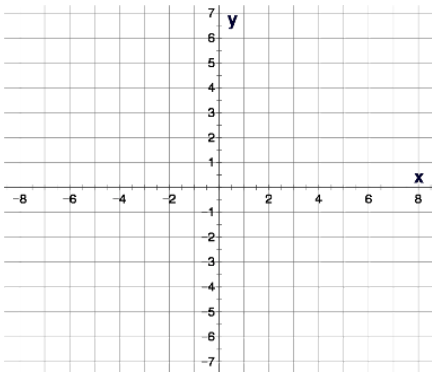
9. $|2x + 12| > 10$

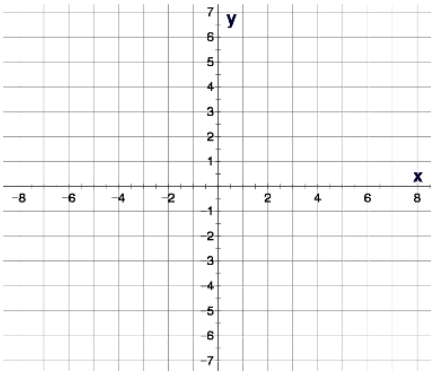
VI. Graphing Non-linear Equations [26.1]

Graph transformations of a function using parameters

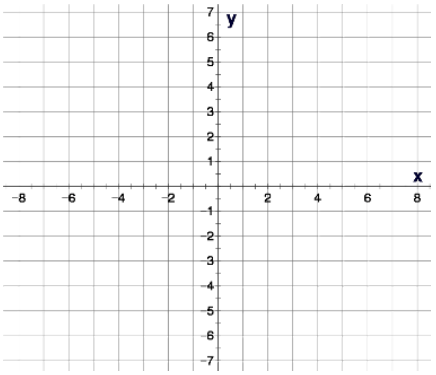
$y = f(x)$ $y = g(x)$ $y = h(x)$

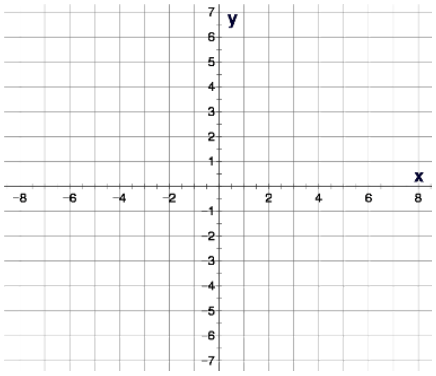


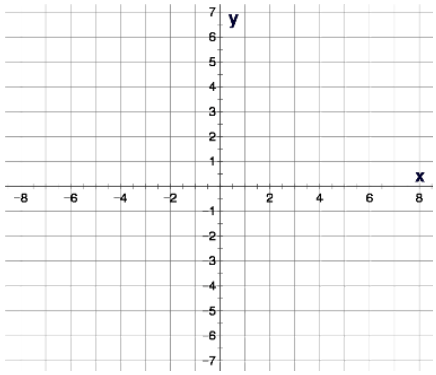




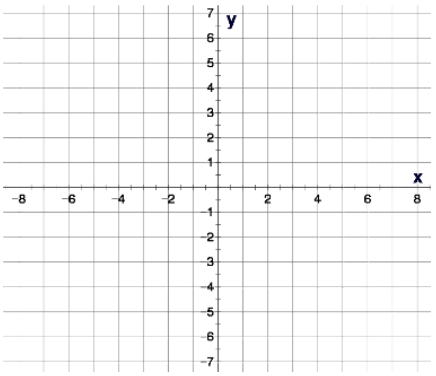
1. $y = f(x - 4)$ 1. $y = g(x - 3)$ 1. $y = h(x - 2)$

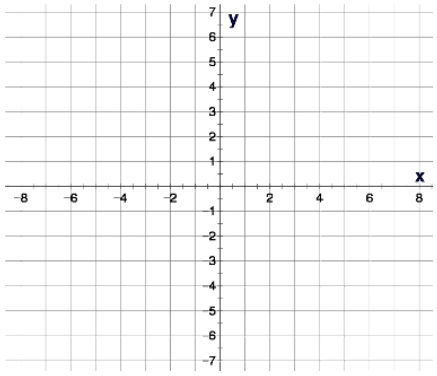


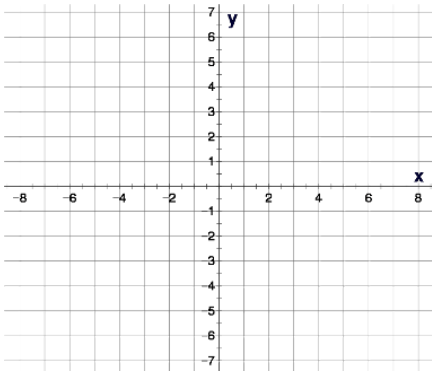




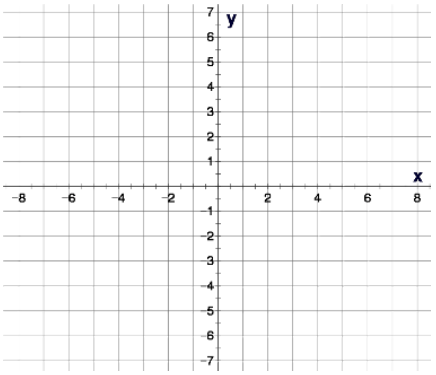
2. $y = f(x + 2)$ 2. $y = g(x + 4)$ 2. $y = h(x + 3)$

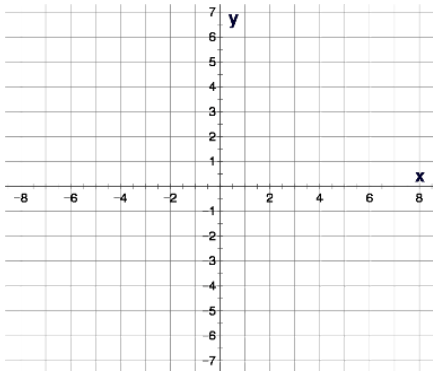


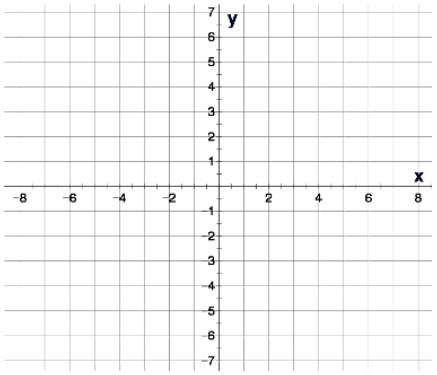




3. $y = - f(x)$ 3. $y = - g(x)$ 3. $y = - h(x)$



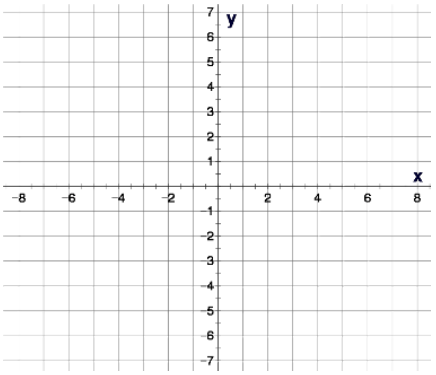




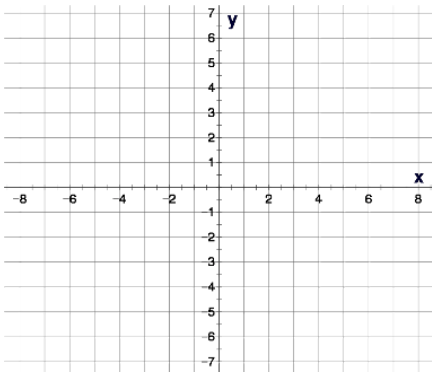
VI. Graphing Non-linear Equations [26.2]

Graph transformations of a function using parameters

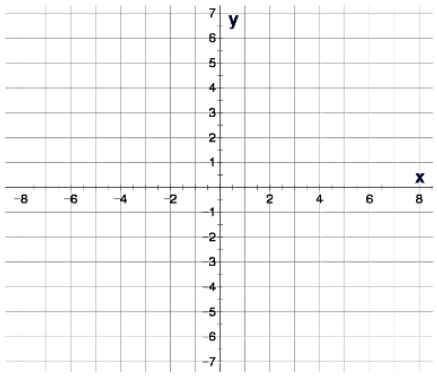
$y = f(x)$ $y = g(x)$ $y = h(x)$



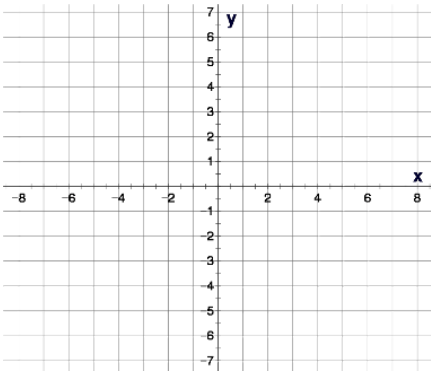
1. $y = f(x) - 4$



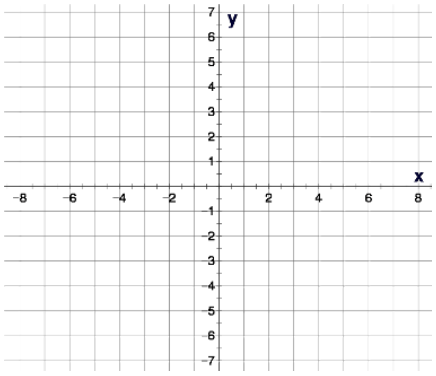
1. $y = g(x) - 3$



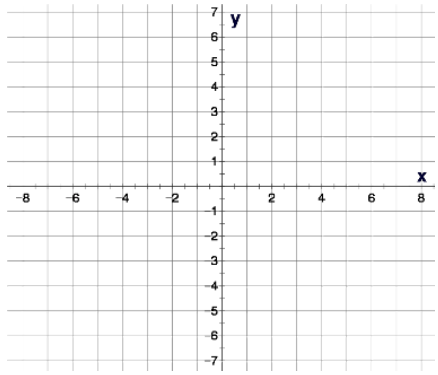
1. $y = h(x) - 2$



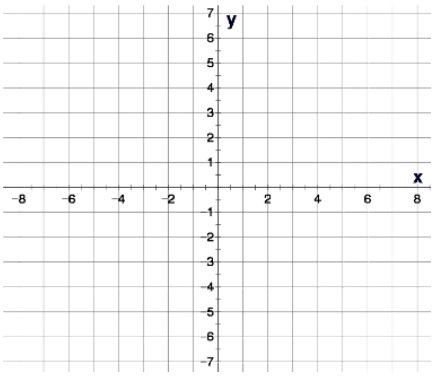
2. $y = f(x) + 2$



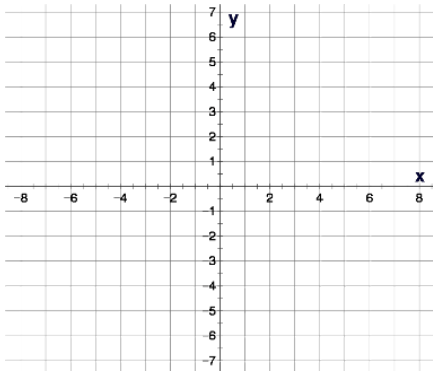
2. $y = g(x) + 1$



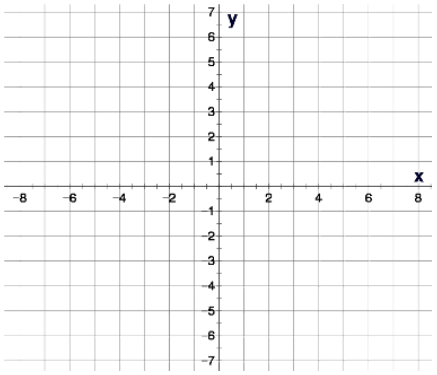
2. $y = h(x) + 2$



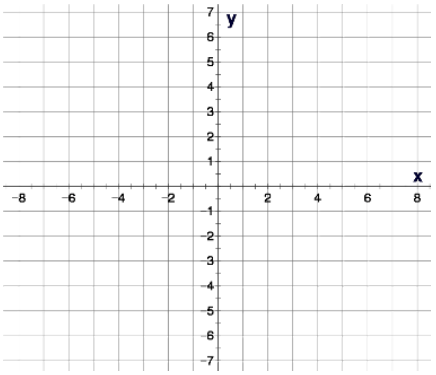
3. $y = f(-x)$

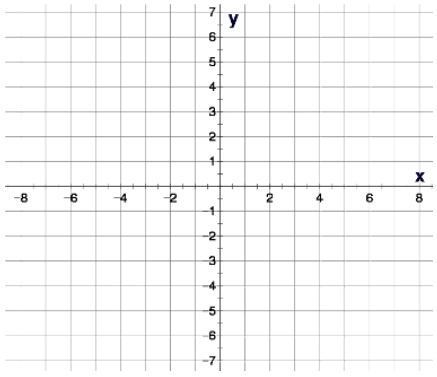


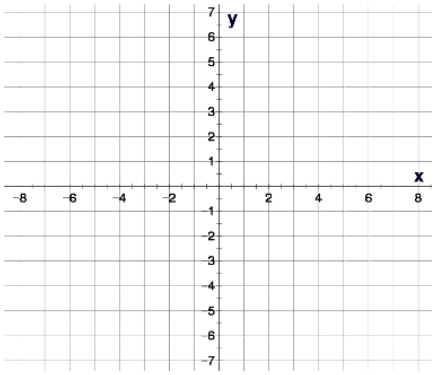
3. $y = g(-x)$



3. $y = h(-x)$



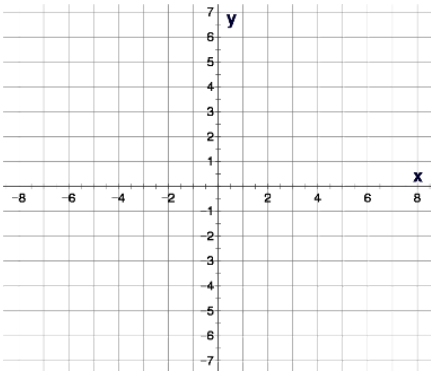




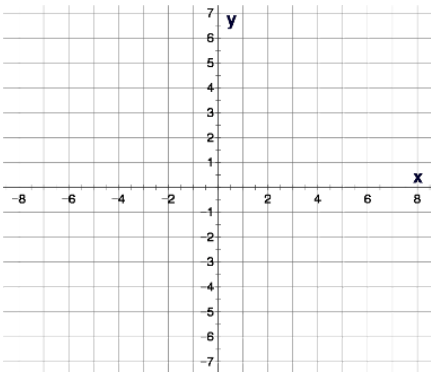
Graphing Non-linear Equations [26.3]

Graph by transformation, label points vertices and endpoints

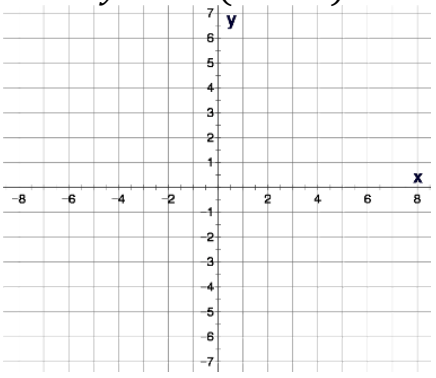
$y = x^2$



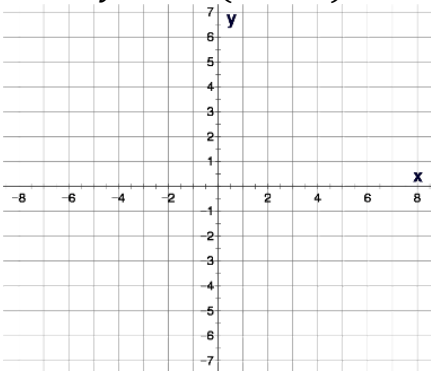
1. $y = (x - 2)^2$



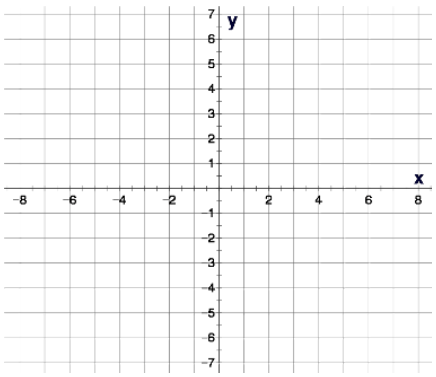
2. $y = -(x - 2)^2$



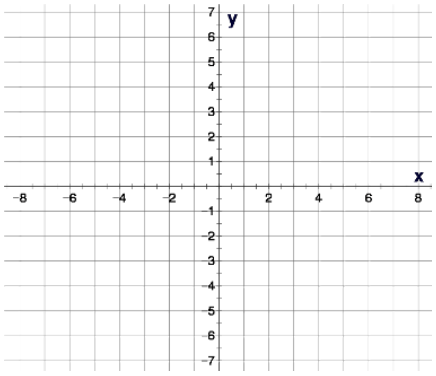
3. $y = -(x - 2)^2 + 3$



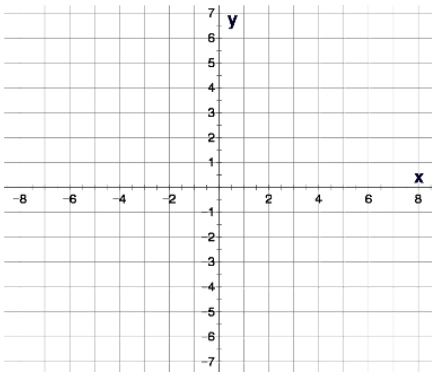
$y = \sqrt{x}$



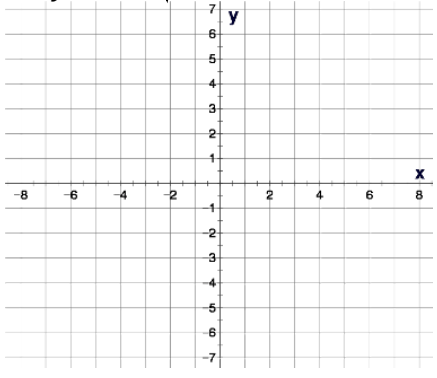
1. $y = \sqrt{x + 4}$



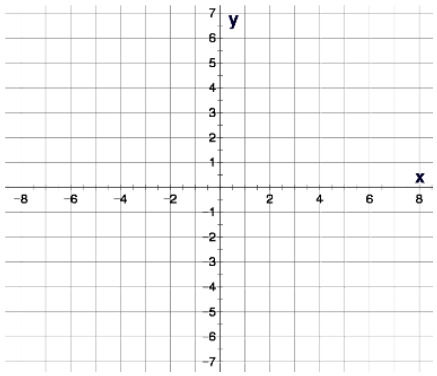
2. $y = -\sqrt{x + 4}$



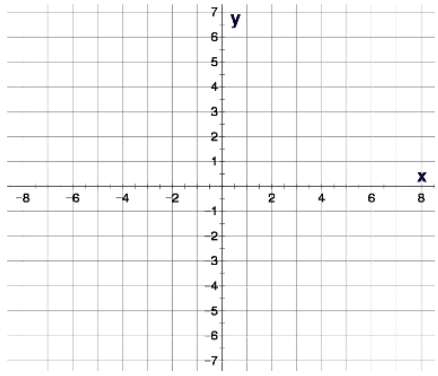
3. $y = -\sqrt{x + 4} + 5$



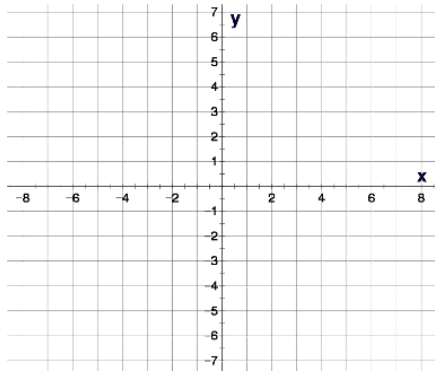
$y = |x|$



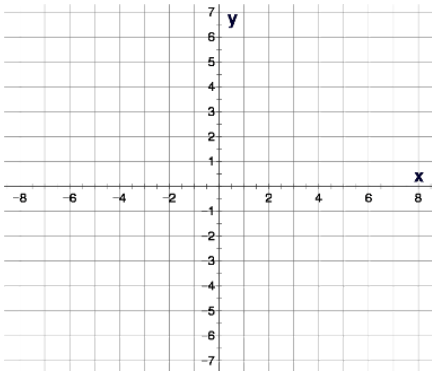
1. $y = |x + 3|$



2. $y = -|x + 3|$



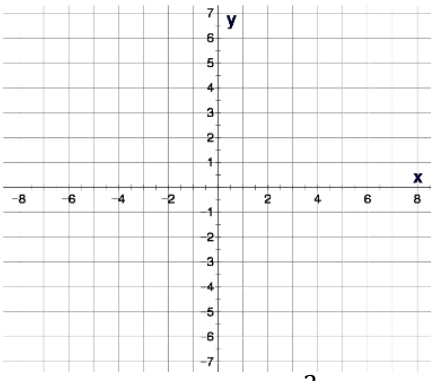
3. $y = -|x + 3| - 4$

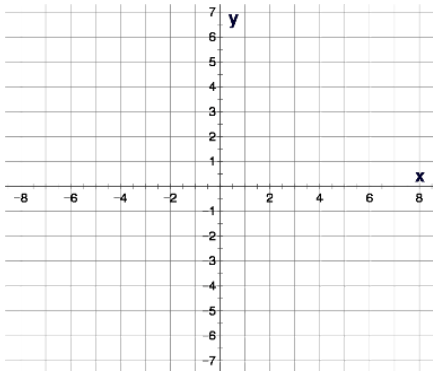


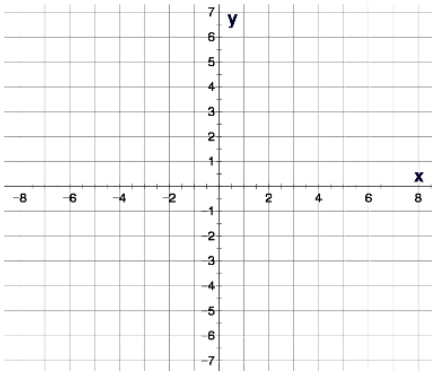
Graphing Non-linear Equations [26.4]

Graph by transformation, label points vertices and endpoints

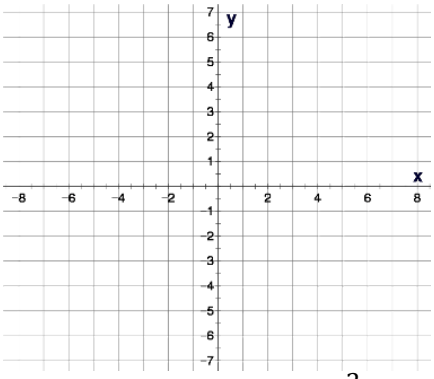
$y = x^2$ $y = \sqrt{x}$ $y = |x|$

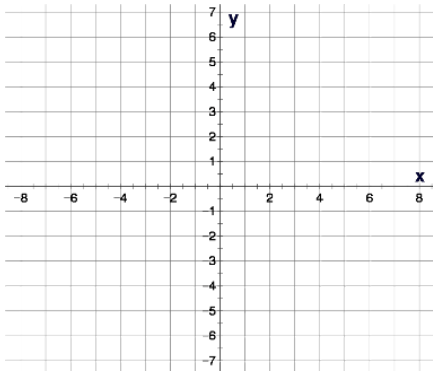


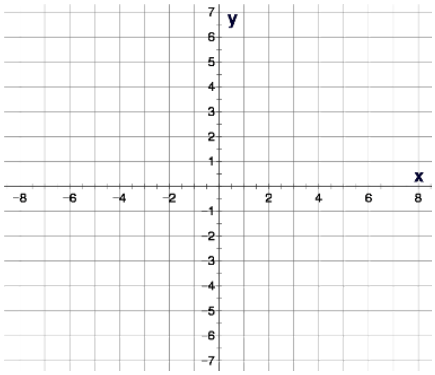




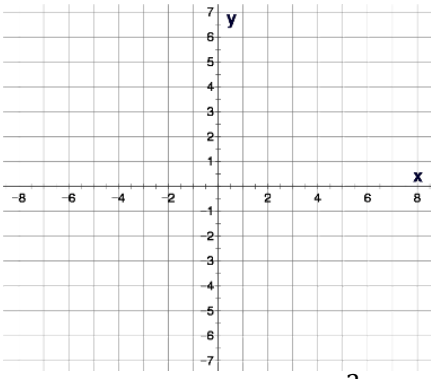
4. $y = (x + 2)^2$ 4. $y = \sqrt{x + 4}$ 4. $y = |x - 3|$

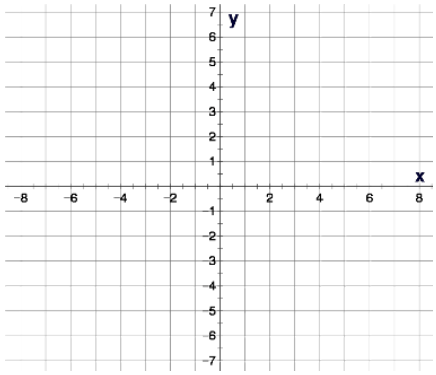


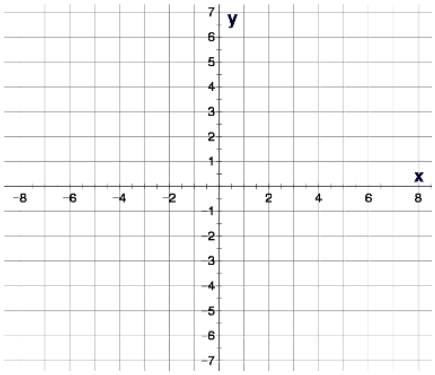




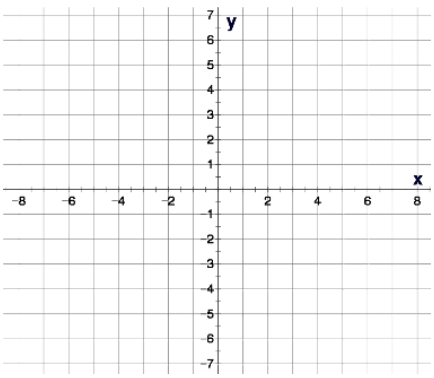
5. $y = (- x + 2)^2$ 5. $y = \sqrt{- x + 4}$ 5. $y = |- x - 3|$

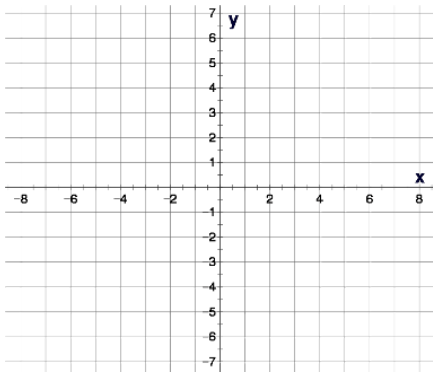


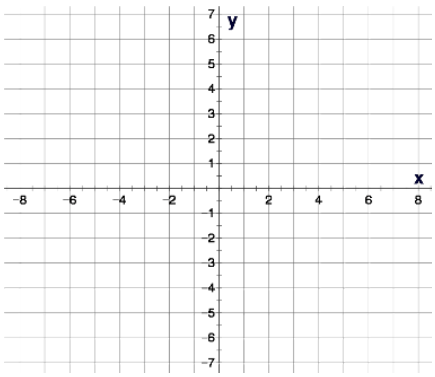




6. $y = (- x + 2)^2 - 3$ 6. $y = \sqrt{- x + 4} + 5$ 6. $y = |- x - 3| - 4$

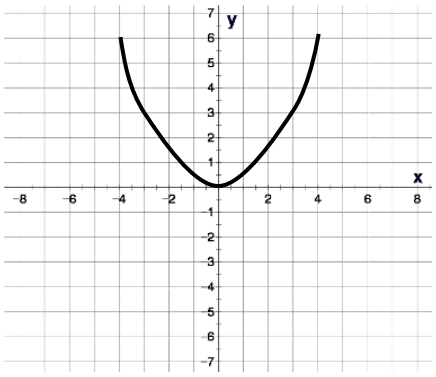






Finding the Domain and Range of graphs Part 1 [27.1]

1.



Domain:

Range:

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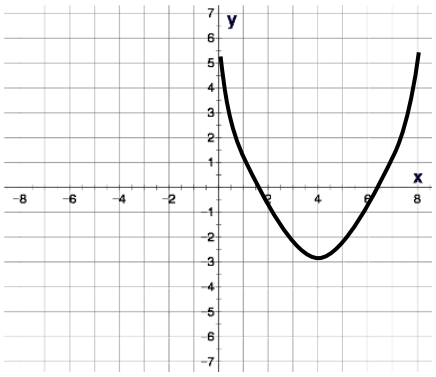

Domain:

Range:

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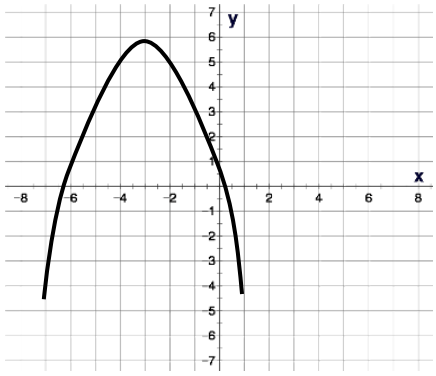

Domain:

Range:

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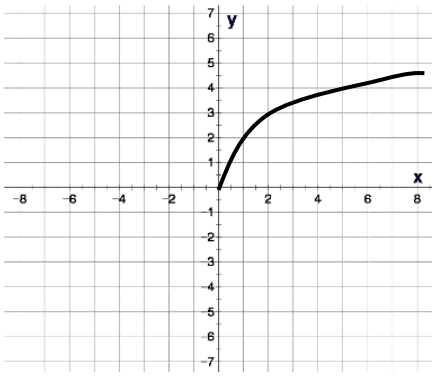

Domain:

Range:

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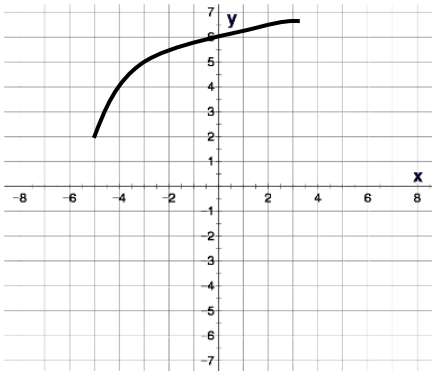

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Range:

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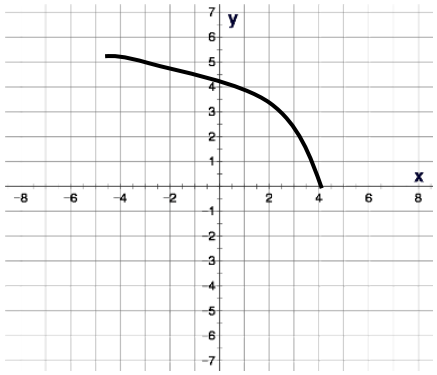

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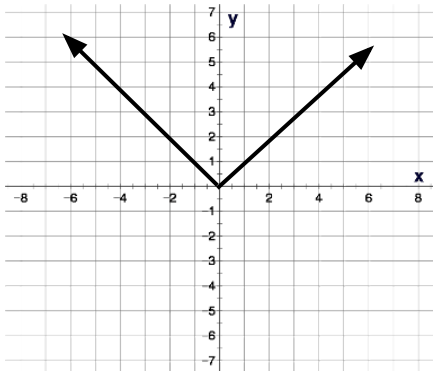

Domain:

Range:

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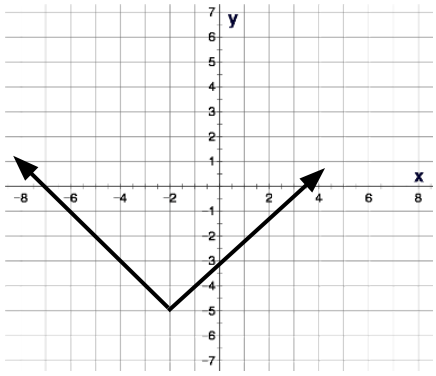

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Range:

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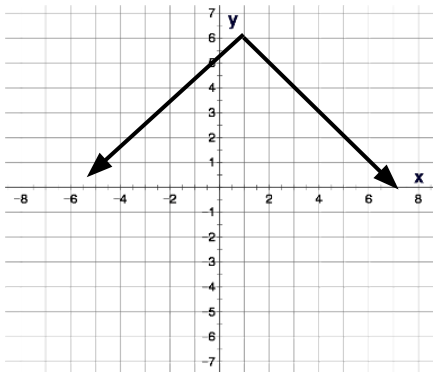


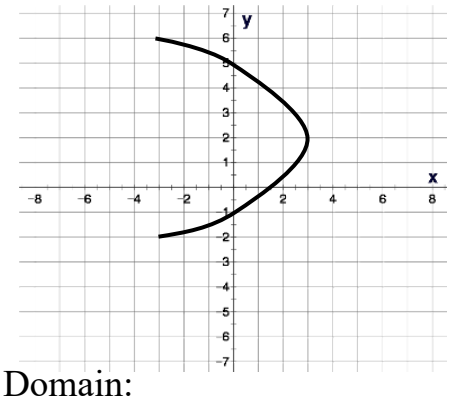
Domain:

Range:

Finding the Domain and Range of graphs Part 1 [27.2]

Find the domain and range of the graph

4.



Domain:

Range:

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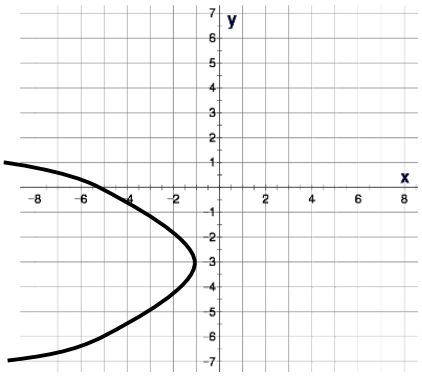
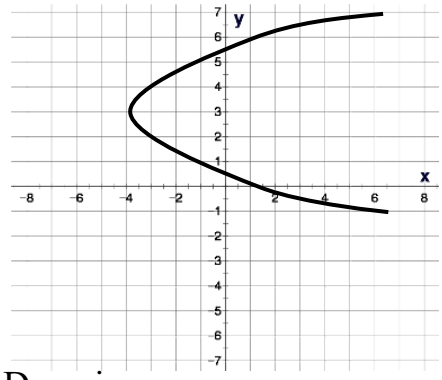


Domain:

Range:

4.



Domain:

Range:

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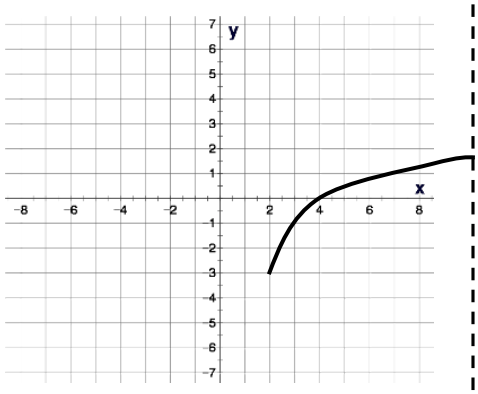

Domain:

Range:

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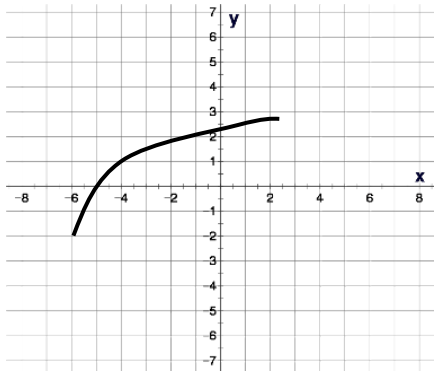

Domain:

Range:

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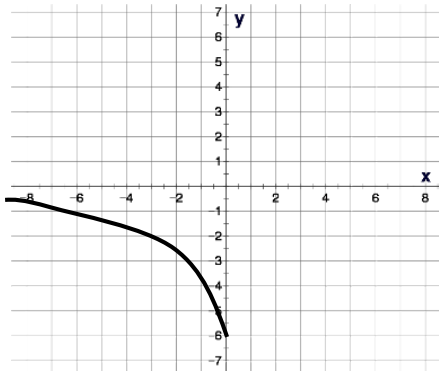

Domain:

Range:

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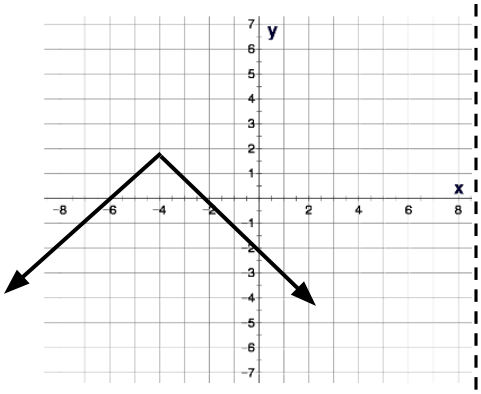

Domain:

Range:

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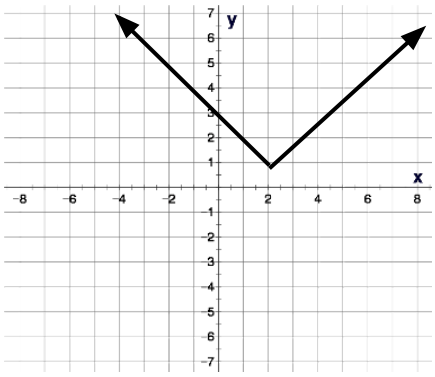
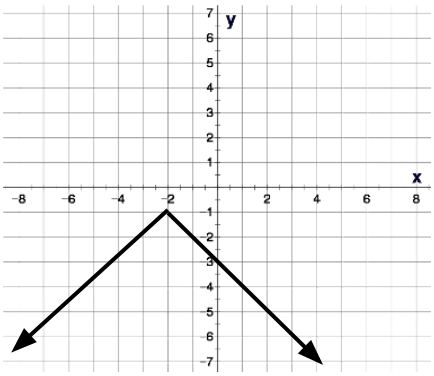


Domain:

Range:

6.



Domain:

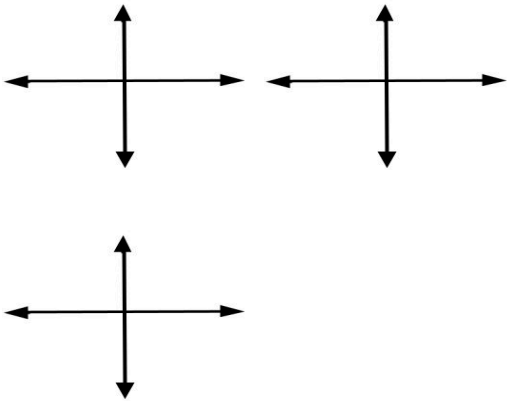
Range:

1. $y = \sqrt{x - 2} + 3$

$y =$

$y =$

$y =$



Domain:

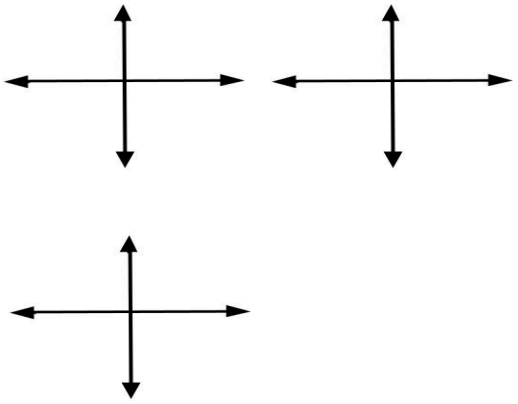
Range:

1. $y = (x - 2)^2 + 3$

$y =$

$y =$

$y =$



Domain:

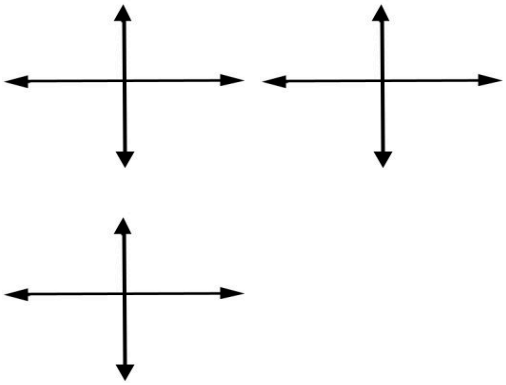
Range:

1. $y = |x - 2| + 3$

$y =$

$y =$

$y =$



Domain:

Range:

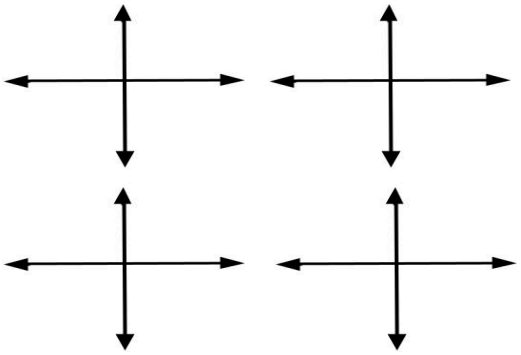
2. $y = -\sqrt{x - 2} + 3$

$y =$

$y =$

$y =$

$y =$



Domain:

Range:

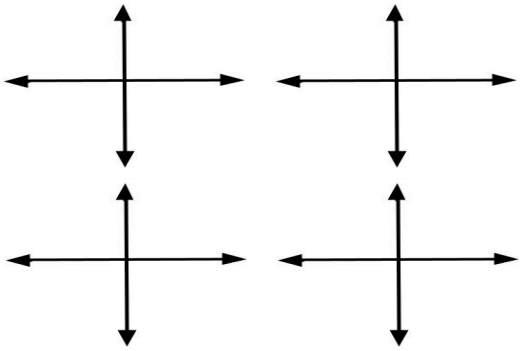
2. $y = -(x - 2)^2 + 3$

$y =$

$y =$

$y =$

$y =$



Domain:

Range:

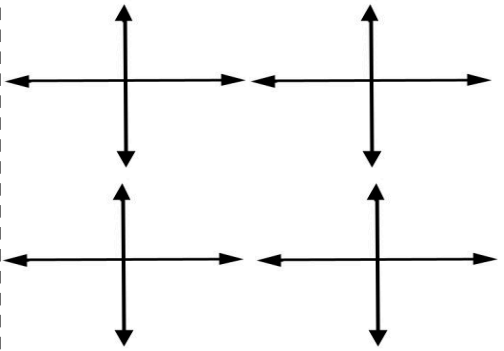
2. $y = -|x - 2| + 3$

$y =$

$y =$

$y =$

$y =$



Domain:

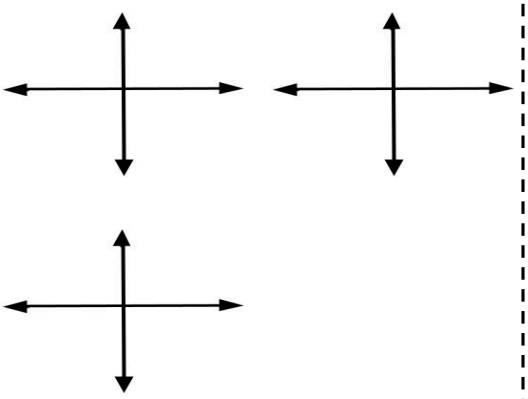
Range:

3. $y = -|x + 6|$

$y =$

$y =$

$y =$



Domain:

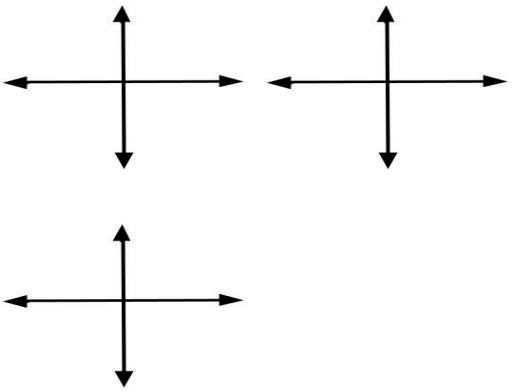
Range:

3. $y = -\sqrt{x + 5}$

$y =$

$y =$

$y =$



Domain:

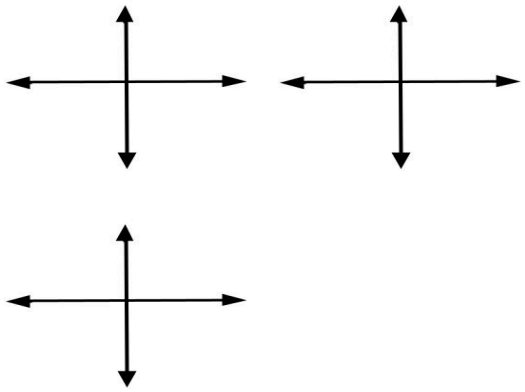
Range:

3. $y = -(x + 4)^2$

$y =$

$y =$

$y =$



Domain:

Range:

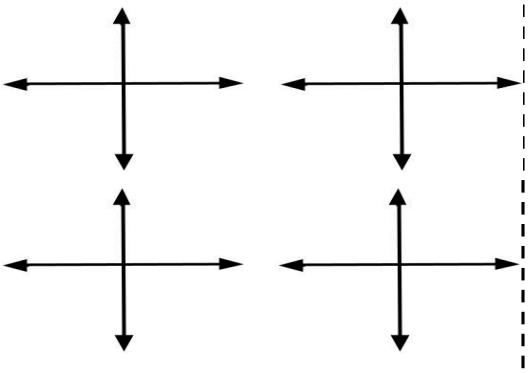
4. $y = -|x + 6| - 3$

$y =$

$y =$

$y =$

$y =$



Domain:

Range:

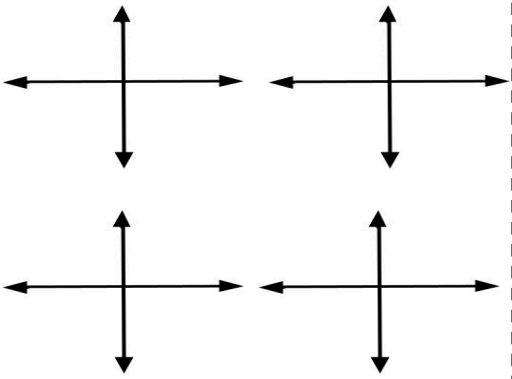
4. $y = -\sqrt{x + 5} + 2$

$y =$

$y =$

$y =$

$y =$



Domain:

Range:

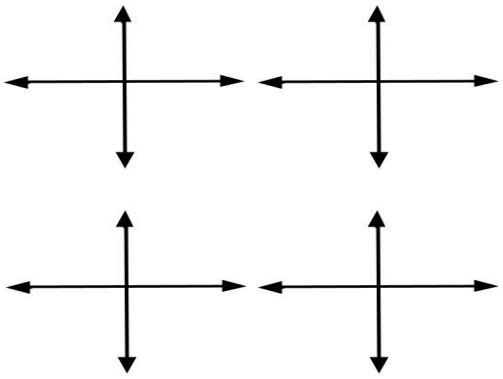
4. $y = -(x + 4)^2 - 4$

$y =$

$y =$

$y =$

$y =$



Domain:

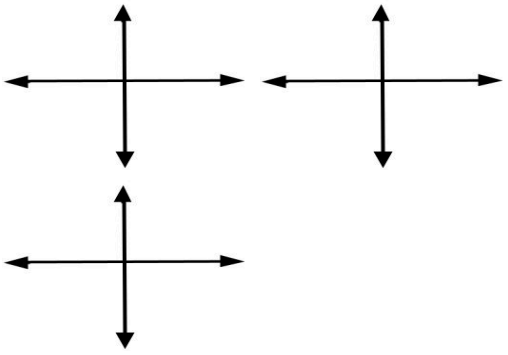
Range:

5. $y = |- x + 2|$

$y =$

$y =$

$y =$



Domain:

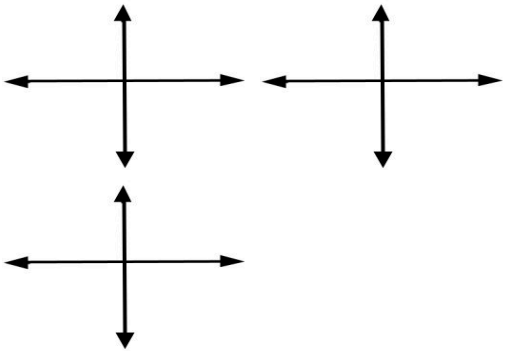
Range:

5. $y = \sqrt{- x + 3}$

$y =$

$y =$

$y =$



Domain:

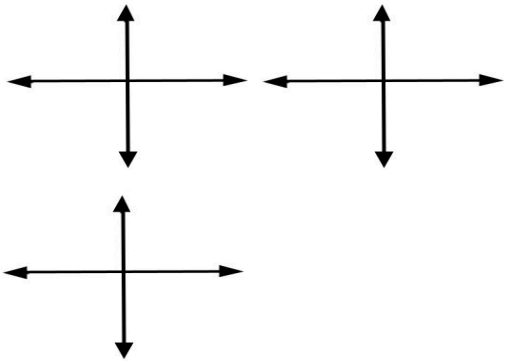
Range:

5. $y = (- x + 4)^2$

$y =$

$y =$

$y =$



Domain:

Range:

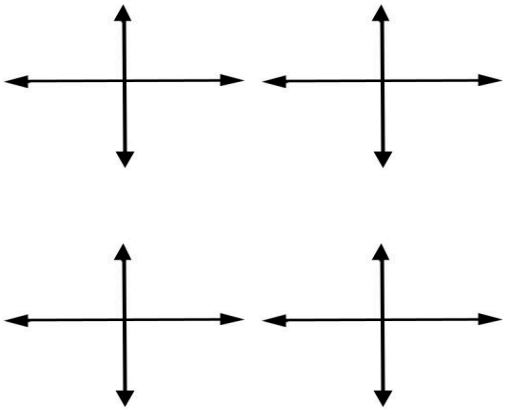
6. $y = |- x - 2| - 3$

$y =$

$y =$

$y =$

$y =$



Domain:

Range:

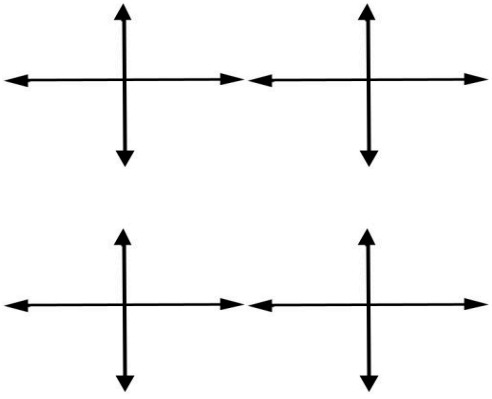
6. $y = \sqrt{- x - 3} + 2$

$y =$

$y =$

$y =$

$y =$



Domain:

Range:

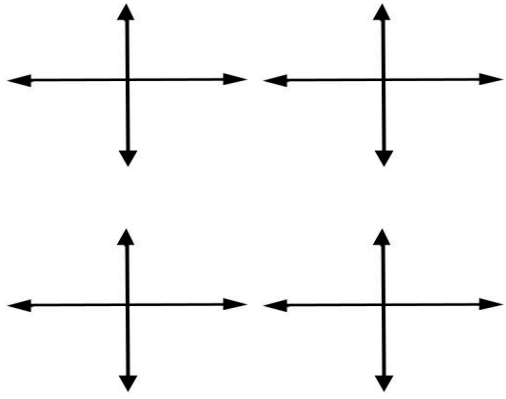
6. $y = (- x - 4)^2 - 4$

$y =$

$y =$

$y =$

$y =$



Domain:

Range:

1. $f(x) = 3x - 10$

x: *All real #'s* $(-\infty, \infty)$ Graph

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

$x \neq 0$ $(-\infty, 0) \cup (0, \infty)$ Graph

3. $f(x) = \frac{x-3}{x+5}$

$x \neq -5$ $(-\infty, -5) \cup (-5, \infty)$ Graph

4. $f(x) = \frac{x-5}{4x+2}$

$x \neq -\frac{1}{2}$ $(-\infty, -\frac{1}{2}) \cup (-\frac{1}{2}, \infty)$ Graph

1. $f(x) = 3x^2 - 9x - 30$

x: *All real #'s* $(-\infty, \infty)$ Graph

2. $f(x) = \frac{5x-4}{10x}$

$x \neq 0$ $(-\infty, 0) \cup (0, \infty)$ Graph

3. $f(x) = \frac{2x+4}{x-7}$

$x \neq 7$ $(-\infty, 7) \cup (7, \infty)$ Graph

4. $f(x) = \frac{x+2}{2x-10}$

$x \neq 5$ $(-\infty, 5) \cup (5, \infty)$ Graph

1. $f(x) = x^3 + 3x^2 - 10x$

2. $f(x) = \frac{x+7}{-3x}$

3. $f(x) = \frac{x-1}{x-0}$

4. $f(x) = \frac{x}{3x+6}$

5. $f(x) = \frac{x}{4x^2-9}$

5. $f(x) = \frac{2x+4}{9x^2-16}$

5. $f(x) = \frac{x^2-9}{169x^2-196}$

$x \neq -\frac{4}{3}, x \neq \frac{4}{3}$ $(-\infty, -\frac{4}{3}) \cup (-\frac{4}{3}, \frac{4}{3}) \cup (\frac{4}{3}, \infty)$Graph

6. $f(x) = \frac{-8x}{x^2-9x+18}$

6. $f(x) = \frac{10}{x^2-11x+18}$

6. $f(x) = \frac{2x-4}{x^2-2x-3}$

$x \neq 2, x \neq 9$ $(-\infty, 2) \cup (2, 9) \cup (9, \infty)$Graph

7. $f(x)=\frac{x}{2x^2+7x-15}$

7. $f(x)=\frac{2x+4}{3x^2-13x-10}$

$x\neq -\frac{2}{3}$, $x\neq 5 (-\infty,-\frac{2}{3})\cup(-\frac{2}{3},5)\cup(5,\infty)$ Graph

7. $f(x)=\frac{x^2-9}{6x^2-5x+1}$

8. $f(x)=\frac{x-8}{x^2+2x-15}$

8. $f(x)=\frac{2x-8}{x^2-3x-10}$

8. $f(x)=\frac{x^2-49}{x^2-7x+18}$

1. $f(x) = \sqrt{x + 4}$

$x \geq -9$ $[-9, \infty)$ 9

2. $f(x) = \sqrt{2x - 4}$

3. $f(x) = \sqrt{-5x + 40}$

1. $f(x) = \sqrt{x + 9}$

2. $f(x) = \sqrt{3x - 9}$

3. $f(x) = \sqrt{-2x + 18}$

$x \geq 3$ $[3, \infty)$ 3

$x \leq -9$ $(-\infty, -9]$ -9

1. $f(x) = \sqrt{x - 1}$

2. $f(x) = \sqrt{4x + 16}$

3. $f(x) = \sqrt{-3x + 24}$

4. $f(x) = \sqrt{-5x - 60}$

5. $f(x) = \sqrt{18 - 3x}$

6. $f(x) = \sqrt{18 - 4x}$

7. $f(x) = \sqrt{4x}$

4. $f(x) = \sqrt{-2x - 24}$

5. $f(x) = \sqrt{12 - 6x}$

$x \leq 2$ $(-\infty, 2]$ 2

6. $f(x) = \sqrt{12 - 8x}$

7. $f(x) = \sqrt{8x}$

4. $f(x) = \sqrt{-3x - 60}$

5. $f(x) = \sqrt{18 - 2x}$

6. $f(x) = \sqrt{18 - 10x}$

7. $f(x) = \sqrt{10x}$

8. $f(x) = \sqrt{x^2 - 7x + 6}$

8. $f(x) = \sqrt{x^2 - 9x + 8}$

8. $f(x) = \sqrt{x^2 - 7x + 10}$

$x \leq 1$ *or* $x \geq 8$ $(-\infty, 1] \cup [8, \infty)$ Graph

9. $f(x) = \sqrt{x^2 + 5x + 6}$

9. $f(x) = \sqrt{x^2 + 6x + 8}$

9. $f(x) = \sqrt{x^2 + 11x + 10}$

$x \leq -4, x \geq -2$ $(-\infty, -4] \cup [-2, \infty)$ Graph

10. $f(x) = \sqrt{x^2 - x - 20}$

10. $f(x) = \sqrt{x^2 - x - 12}$

10. $f(x) = \sqrt{x^2 - x - 6}$

11. $f(x) = \sqrt{x^2 - 5x + 6}$

11. $f(x) = \sqrt{x^2 - 6x + 8}$

11. $f(x) = \sqrt{x^2 - 11x + 10}$

VII. Simplifying Rational Expressions Part 1 [31.1]

1. $\frac{x(x-2)(x+3)}{x^2(x+3)}$

1. $\frac{x(x+5)(x-8)}{x^3(x+5)}$

1. $\frac{x(x-2)(x+1)}{x^4(x+1)(x-1)}$

2. $\frac{x^3(x-2)^3(x+3)^4}{x^2(x+3)^2}$

2. $\frac{x^4(x+5)^2(x-8)}{x^3(x+5)^3}$

2. $\frac{x^2(x-2)^2(x+1)^3}{x^4(x+1)(x-2)^3}$

3. $\frac{9x^2(x+5)^4(x-5)^4}{6x^2(x-5)^3(x+5)^5}$

3. $\frac{10x(x+1)^4(x-1)^2}{15x(x-1)^3(x+1)^3}$

3. $\frac{20x^3(x+3)^3(x-3)^1}{12x^3(x-3)^2(x+3)^2}$

4. $\frac{(x^2-9)(x+4)}{(x+3)(x^2-16)}$

5. $\frac{(4x^2-1)(x+3)}{(2x+1)(x^2-9)}$

6. $\frac{(4x^2-1)(x+3)^2}{(2x+1)(x^2-9)}$

4. $\frac{(x^2-25)(x+6)}{(x+5)(x^2-36)}$

5. $\frac{(25x^2-16)(x+7)}{(5x+4)(x^2-49)}$

6. $\frac{(25x^2-16)(x+7)^2}{(5x+4)(x^2-49)}$

4. $\frac{(x^2-49)(x-8)}{(x-7)(x^2-64)}$

5. $\frac{(9x^2-4)(x-9)}{(3x-2)(x^2-81)}$

6. $\frac{(25x^2-4)(x-1)^2}{(5x-2)^2(x^2-1)}$

Simplifying Rational Expressions Part 2 [32.1]

1. $\frac{x^2+3x+2}{x^2+4x+3}$

2. $\frac{x^2+3x-4}{x^2+2x-3}$

3. $\frac{x^2-3x+2}{x^2-1x-2}$

1. $\frac{x^2+4x+3}{x^2+5x+4}$

2. $\frac{x^2-3x-10}{x^2-5x-14}$

3. $\frac{x^2-1x-6}{x^2-5x+6}$

1. $\frac{x^2+5x+4}{x^2+7x+6}$

2. $\frac{x^2+2x-15}{x^2-2x-3}$

3. $\frac{x^2-5x+4}{x^2+3x-4}$

4. $\frac{2x^2+3x+1}{2x^2+5x+3}$

5. $\frac{x^2-5x-14}{x^2-3x-10}$

6. $\frac{x^2-3x+2}{x^2-1}$

4. $\frac{3x^2+7x+2}{3x^2+4x-4}$

5. $\frac{x^2-2x-3}{x^2+2x-15}$

6. $\frac{x^2-5x+4}{x^2-16}$

4. $\frac{3x^2-1x-2}{5x^2-2x-3}$

5. $\frac{x^2+3x-4}{x^2+2x-3}$

6. $\frac{x^2-4}{x^2-5x+6}$

Adding Rational Expressions [33.1]

1. $\frac{4}{x^{4}(x+3)^{2}} + \frac{1}{x^{2}(x+3)^{4}}$

2. $\frac{3}{x(x-5)^{3}} + \frac{2}{x^{3}(x-5)^{1}}$

3. $\frac{2}{x(x+2)^{3}} + \frac{1}{x^{4}(x+2)^{5}}$

1. $\frac{4}{x^{2}(x+1)^{5}} + \frac{1}{x^{4}(x+1)^{3}}$

2. $\frac{2}{x(x-6)^{6}} + \frac{3}{x^{3}(x-6)^{4}}$

3. $\frac{3}{x(x+3)^{2}} + \frac{1}{x^{3}(x+3)^{4}}$

1. $\frac{4}{x^{3}(x+4)^{1}} + \frac{1}{x^{2}(x+4)^{3}}$

2. $\frac{2}{x^{4}(x-4)^{2}} + \frac{2}{x^{1}(x-4)^{4}}$

3. $\frac{2}{x^{3}(x+4)^{4}} + \frac{2}{x^{2}(x+4)^{6}}$

4. $\frac{4}{x^{4}(x+3)^{2}} + \frac{1}{x^{2}(x+3)^{3}}$

5. $\frac{3}{x(x-5)^{5}} + \frac{2}{x^{3}(x-5)^{6}}$

6. $\frac{2}{x(x+2)^{4}} + \frac{1}{x^{4}(x+2)^{3}}$

4. $\frac{4}{x^{1}(x+1)^{4}} + \frac{1}{x^{3}(x+1)^{3}}$

5. $\frac{2}{x^{4}(x-6)^{5}} + \frac{3}{x(x-6)^{4}}$

6. $\frac{3}{x(x+3)^{5}} + \frac{1}{x^{5}(x+3)^{4}}$

4. $\frac{4}{x^{3}(x+4)^{1}} + \frac{1}{x^{2}(x+4)^{2}}$

5. $\frac{2}{x^{3}(x-4)^{1}} + \frac{2}{x^{2}(x-4)^{2}}$

6. $\frac{2}{x^{3}(x+4)^{2}} + \frac{2}{x(x+4)^{1}}$

7. $\frac{5}{3x^{4}(x+3)^{7}} + \frac{3}{2x^{2}(x+3)^{6}}$

8. $\frac{4}{5x^{2}(x-7)^{3}} + \frac{1}{6x^{3}(x-7)^{2}}$

9. $\frac{4}{3x^{5}(x-2)^{2}} + \frac{2}{6x^{3}(x-2)^{1}}$

7. $\frac{3}{4x^{2}(x+1)^{6}} + \frac{1}{3x^{4}(x+1)^{5}}$

8. $\frac{3}{4x^{5}(x-5)^{4}} + \frac{1}{3x^{3}(x-5)^{3}}$

9. $\frac{5}{2x^{6}(x-1)^{4}} + \frac{3}{4x^{3}(x-1)^{3}}$

7. $\frac{7}{5x^{3}(x+4)^{2}} + \frac{3}{4x^{2}(x+4)^{1}}$

8. $\frac{1}{2x^{1}(x-4)^{2}} + \frac{2}{3x^{3}(x-4)^{1}}$

9. $\frac{3}{2x^{1}(x-5)^{5}} + \frac{5}{6x^{3}(x-5)^{4}}$

10. $\frac{5}{6x^{4}(x-1)^{6}} + \frac{3}{4x^{3}(x-1)^{5}}$

11. $\frac{3}{6x^{4}(x-4)^{1}} + \frac{4}{3x^{6}(x-4)^{2}}$

12. $\frac{4}{12x^{3}(x+1)^{1}} + \frac{2}{8x^{3}(x+1)^{2}}$

10. $\frac{4}{8x^{4}(x-5)^{4}} + \frac{2}{6x^{5}(x-5)^{3}}$

11. $\frac{4}{4x^{5}(x-6)^{3}} + \frac{3}{2x^{3}(x-6)^{4}}$

12. $\frac{5}{12x^{4}(x+1)^{3}} + \frac{3}{9x^{4}(x+1)^{4}}$

10. $\frac{7}{9x^{3}(x-7)^{2}} + \frac{2}{6x^{2}(x-7)^{1}}$

11. $\frac{3}{4x^{1}(x-8)^{5}} + \frac{2}{8x^{3}(x-8)^{6}}$

12. $\frac{3}{15x^{1}(x+7)^{4}} + \frac{2}{6x^{1}(x+7)^{5}}$

Solving rational equations [34.1]

Solve for x

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

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

1. $\frac{1}{2x} + \frac{3}{5x} = \frac{1}{4}$

2. $\frac{1}{2} + \frac{3}{5} = \frac{1}{4x}$

1. $\frac{3}{4x} + \frac{2}{5x} = \frac{1}{2}$

2. $\frac{3}{4} + \frac{2}{5} = \frac{1}{2x}$

Solving rational equations [34.2]

Solve for x

3. $\frac{2}{9} + \frac{1}{6x} = \frac{2}{3} - \frac{5}{2x}$

4. $\frac{4}{3x} - \frac{1}{6x} = \frac{5}{2} - \frac{1}{3}$

3. $\frac{1}{2} + \frac{2}{3x} = \frac{1}{12} - \frac{5}{4x}$

4. $\frac{5}{2x} - \frac{2}{4x} = \frac{11}{8} - \frac{1}{2}$

3. $\frac{4}{9x} - \frac{5}{6x} = \frac{2}{3x} + \frac{1}{6}$

4. $\frac{4}{9} - \frac{5}{6} = \frac{2}{3x} - \frac{1}{6x}$

Solving rational equations [34.3]

Solve for x

5. $\frac{3}{8} + \frac{1}{4x} = \frac{3}{2} - \frac{5}{x}$

6. $\frac{5}{3x} - \frac{1}{6x} = \frac{3}{2} - \frac{1}{3}$

5. $\frac{7}{10} + \frac{2}{5x} = \frac{1}{2} - \frac{5}{x}$

6. $\frac{3}{2x} - \frac{1}{4x} = \frac{5}{8} - \frac{1}{2}$

5. $\frac{5}{9} + \frac{1}{6x} = \frac{2}{3} - \frac{5}{x}$

6. $\frac{4}{9x} - \frac{5}{6x} = \frac{2}{3} - \frac{1}{6}$

Isolating terms in formulas [35.1]

Solve for the given term

1. $A = 4\pi r^2, r$

2. $A = \frac{a+b+c}{3}, c$

3. $A = k(b - c + d), b$

1. $A = 36\pi r^2, r$

2. $A = \frac{a+b}{2}, b$

3. $A = k(b - c), b$

1. $A = 9\pi r^2, r$

2. $A = \frac{a+b+c+d}{4}, a$

3. $A = k(b - c + d - e), b$

Isolating terms in formulas [35.2]

Solve for the given term

4. $A = 5(2b + 3c)$, b

4. $B = 7(3b + 4c)$, b

4. $C = 9(4b + 5c)$, b

5. $A = \frac{h(b_1 - b_2 + b_3)}{3}$, b_1

5. $A = \frac{h(b_1 + b_2 - b_3)}{3}$, b_1

5. $A = \frac{h(b_1 + b_2)}{2}$, b_1

Isolating terms in formulas [35.3]

Solve for the given term

6. $a^2 - b^2 + c^2 = d^2,\ a$

6. $a^2 - b^2 - c^2 = d^2,\ a$

6. $a^2 + b^2 = c^2,\ a$

7. $a^3 - b^3 - c^3 = d,\ a$

7. $a^3 - b^3 + c^3 = d,\ a$

7. $a^3 + b^3 + c^3 = d,\ a$

8. $\sqrt[3]{a^2 + b^2 + c^2} = d$,c

8. $\sqrt[4]{a^2 - b^2 + c^2} = d$,c

8. $\sqrt{c^2 - b^2} = a$,c

VIII. Verifying solutions of systems [36.1]

1. $2x + 3y = 13\ (3, 2) and (2, 3)$

2. $2x + 4y = -2\ (3, -2) and (-3, 2)$

3. $y = 2x + 4\ (-2, 1) and (-1, 2)$

4. $y = -3x - 8\ (1, -11) and (1, -5)$

1. $3x + 5y = 14\ (1, 3) and (3, 1)$

2. $2x + y = -8\ (5, -2) and (-5, 2)$

3. $y = 4x - 9\ (-2, 1) and (2, -1)$

4. $y = -5x + 8\ (-1, 13) and (1, 3)$

1. $x + 2y = 7\ (1, 3) and (-1, -3)$

2. $3x + 2y = -14\ (-4, -1) and (-1, -4)$

3. $y = 3x + 5\ (-1, -3) and (-2, -1)$

4. $y = -x - 5\ (-4, -2) and (-2, -3)$

Verifying solutions of systems [36.2]

5. $2x + 3y = 13,\ y = 2x - 1\ (2, 3)$ 5. $3x + 5y = 14\ ,y = 3x - 8\ (3, 1)$ 5. $x + 2y = 7\ ,y = x + 2\ (1, 3)$

6. $2x + 4y = -2,\ x = y + 5\ (3, -2)$ 6. $2x + y = -8\ ,x = y - 7\ (-5, 2)$ 6. $3x + 2y = -14,\ x = 2y - 2\ (-4, -1)$

7. $y = 2x + 4\ ,2x - 3y = -8\ (-1, 2)$ 7. $y = 4x - 9\ 3x - 2y = 8\ (2, -1)$ 7. $x - 2, y = 5\ y = 3x + 5\ (-1, -3)$

8. $y = -3x - 8\ ,y = 2x + 7\ (1, -1)$ 8. $y = -5x + 8,\ y = 4x - 10\ (-1, 13)$ 8. $y = -x - 5,\ y = 3x + 11\ (-4, -1)$

Solving systems by substitution [37.1]

1. $2x + 3y = 13,\ y = 2x - 1$

2. $2x + 4y = -2, x = y + 5$

1. $3x + 5y = 14,\ y = 3x - 8$

2. $2x + y = -8, x = y - 7$

1. $x + 2y = 7, y = x + 2$

2. $3x + 2y = -14, x = 2y - 2$

3. $2x - 3y = -8, y = 2x + 4$

4. $y = -3x - 8. y = 2x + 7$

3. $3x - 2y = 8, y = 4x - 9$

4. $y = -5x + 8, y = 4x - 10$

3. $x - 2y = 5, y = 3x + 5$

4. $y = -x - 5, y = 3x + 11$

Solving systems by elimination [38.1]

1. $2x + 3y = 13, -2x + y = -1$

2. $2x + 4y = -2, 4x - 4y = 20$

1. $3x + 5y = 14, -3x + y = -8$

2. $2x + y = -8, x - y = -7$

1. $x + 2y = 7, -x + y = 2$

2. $3x + 2y = -14, x - 2y = -2$

3. $2x + 3y = 13, -4x + 2y = -2$

3. $3x + 5y = 14, -6x + 2y = -16$

3. $3x + 6y = 21, -x + y = 2$

4. $3x + 6y = -3, 4x - 4y = 20$

4. $4x + 2y = -16, 3x - 3y = -21$

4. $9x + 6y = 63, 5x - 10y = -5$

5. $3x + 2y = 1\,, x - 5y = 6$

6. $3x - 2y = 14\,, 2x - 5y = 13$

5. $3x + 2y = 10\,, x - 5y = 9$

6. $3x - 2y = 19\,, 2x - 5y = 20$

5. $3x + 2y = 8\,, x - 5y = 14$

6. $3x - 2y = 6\,, 2x - 5y = -7$

Scientific Notation [39.1]

Convert to Standard Notation

1. 1.5×10^{2}
2. 1.5×10^{-2}
3. 9.005×10^{1}
4. 9.005×10^{-1}

1. 5.25×10^{3}
2. 5.25×10^{-3}
3. 7.0075×10^{1}
4. 7.0075×10^{-1}

1. 8.125×10^{4}
2. 8.125×10^{-4}
3. 5.9×10^{1}
4. 5.9×10^{-1}

Convert to Scientific Notation

5. 13500
6. 0.013500

5. 456000
6. 0.00456

5. 8702000
6. 0.8702

7. 103500

7. 4005600

7. 80070250

8. 0.00105

8. 0.005006

8. 0.00001

Scientific Notation

Convert to Scientific Notation

9. 900.5×10^{1}

9. 70.075×10^{1}

9. 590×10^{1}

10. 900.5×10^{-1}

10. 70.075×10^{-1}

10. 590×10^{-1}

11. 0.015×10^{2}

11. 0.0525×10^{3}

11. 0.8125×10^{4}

12. 0.015×10^{-2}

12. 0.0525×10^{-3}

12. 0.8125×10^{-4}

13. $(1.5\times10^{2})(1.5\times10^{3})$

14. $(0.8\times10^{3})(0.8\times10^{-4})$

15. $(0.12\times10^{-2})(0.12\times10^{-3})$

16. $(0.05\times10^{6})(0.05\times10^{-3})$

13. $(1.4\times10^{3})(1.4\times10^{4})$

14. $(0.9\times10^{2})(0.9\times10^{-5})$

15. $(0.16\times10^{-1})(0.16\times10^{-2})$

16. $(0.09\times10^{5})(0.09\times10^{-2})$

13. $(1.4\times10^{1})(1.5\times10^{4})$

14. $(0.8\times10^{1})(0.9\times10^{-4})$

15. $(0.12\times10^{-1})(0.16\times10^{-3})$

16. $(0.05\times10^{6})(0.09\times10^{-2})$

Solve:

1.The distance varies directly with the speed. The distance traveled is 150 miles while the speed is 60 mph. What will the distance be if the speed is changed to 50 mph?

2. The area of a circle varies directly with its radius squared. The area is 28.26 cm^2 while the radius is 3 cm.| What would the area be if the radius was 2 cm?

1.The distance varies directly with the speed. The distance traveled is 300 miles while the speed is 50 mph. What will the distance be if the speed is changed to 60 mph?

2. The area of a circle varies directly with its radius squared. The area is 12.56 cm^2 while the radius is 2 cm.| What would the area be if the radius was 3 cm?

3.The price varies inversely with the demand.
The price is $250 while the demand is 100 orders.
How many units will be in demand if the price is $200?

4. To preserve the volume of cone, the height must vary inversely with the radius squared. The height is 90 ft while the radius is 2 ft. What would the height be if the the radius is 3 ft to preserve the volume?

3.The price varies inversely with the demand.
The price is $240 while the demand is 10 orders.
How many units will be in demand if the price is $200?

4. To preserve the volume of cone, the height must vary inversely with the radius squared. The height is 10 inches while the radius is 3 inches. What would the height be if the radius is 6 inches to preserve the volume?

5.The volume of a sphere varies directly with the radius cubed. The volume of the sphere is 13.5 m^3 while the radius is 1.5 m. What would the volume be if the radius was 1 m?

6. To preserve the volume of a square prism, the height must vary inversely with the side length squared. The height is 10 yards while the side length is 2 yards. What would the height be if the side length was 4 yards?

5.The volume of a sphere varies directly with the radius cubed. The volume of the sphere is 32 m^3 while the radius is 2 m. What would the volume be if the radius was 3 m?

6. To preserve the volume of a square prism, the height must vary inversely with the side length squared. The height is 90 yards while the side length is 1.5 yards. What would the height be if the side length was 3 yards?

Name:_____ **Alg I** Date:_____ Topic:_____ SSG:_____Score:_____

Name:_____ **Alg II** Date:_____ Topic:_____ SSG:_____Score:_____