MATH 0310
Intermediate Algebra
Homework Assignments

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Ch 2 Absolute Value Equations

2.5 Absolute Value Equations

Do all work on notebook paper. All steps should be shown. All work should be neat and organized.

Find the solutions of the following equations.

3. $|z| = 23$

6. $|t| = -4$

9. $|-s| = 0$

12. $|3z| = -6$

15. $|5s| = 13$

18. $2|x| = 34$

21. $4|-s| = 24$

24. $-5|z| = 40$

27. $|x| + 5 = 9$

30. $|x| + 6 = 6$

33. $|x - 7| = 9$

36. $|2x - 6| = 0$

39. $2|3 - 4x| = 15$

42. $-2|5x + 1| = -14$

45. $|2x - 4| - 2 = 11$

48. $|2 - 3x| + 4 = 1$

51. $2|x + 3| - 5 = 7$

54. $4 - |x + 2| = 2$

57. $10 - 5|6 - 4x| = 12$

60. $1.8|23.9x + 13.1| - 6.005 = 394$

63. $|6 - x| = |4x + 3|$

66. $|3x - 1| = |5 - 2x|$

69. $\left|\frac{1}{2}x + 5\right| = |x - 2|$

72. $|x + 2| = |x - 1|$

75. $\left|\frac{1}{2}x - \frac{1}{3}\right| = \left|\frac{1}{2}x + \frac{1}{4}\right|$

Ch 3 Factoring Polynomials and Factorable Quadratic Equations

3.3 GCF and Grouping

Do all work on notebook paper. All steps should be shown. All work should be neat and organized.

Factor completely.

1. $10x^2 - 35$
2. $8x^3 + 18xy + 2x$
3. $-6x^5 - 18x^3 - 10x^2$
4. $4x(x-2y) - 6y(x-2y)$
5. $2x(x-3) + (x-3)$
6. $8y^2z(1-5x) - 6yz^3(1-5x)$
7. $15x(y-3) - 5z(3-y)$
8. $2ax + 3bx + 2ay + 3by$
9. $6cf - 2cg + 6df - 2dg$
10. $4x + 15xy - 3x^2 - 20y$
11. $3x^2y - 5x^2y^2 - 12xy^2 + 20xy^3$
12. $3y^3 + 7y^2 + 18y + 42$
13. $8x^6 + 12x^4 + 40x^3 + 60x$
14. $54y^3 + 6x^4 - 27x^3y - 12xy^2$
15. $3x^3y^3 - 15x^5y^3 + 9x^4y^5$
16. $x(3x-5) - 7(3x-5)$
17. $4x(x-2y) - 6y(x-2y)$
18. $12ac - 4ad - 3bc + bd$
19. $2x^2 - 4xy - x + 2y$
20. $-42x^2z^3 + 6x^2z^2 + 14xz^4 - 2xz^3$
21. $12x^4 + 7xy - 21x^3 - 4x^2y$

3.4 Factoring Binomials

Do all work on notebook paper. All steps should be shown. All work should be neat and organized.

Factor completely.

1. $x^2 - 9$
2. $36x^2 - 49y^2$
3. $27x^3y - 12xy^3$
4. $3x^2 + 48$
5. $81x^4 - 16y^4$
6. $(x-3)^2 - 49$
7. $(2x+3y)^2 - 9z^2$
8. $x^3 - 64$
9. $8x^3 + 1$
10. $64x^3 - 27y^3$
11. $54x^3 + 128y^3$
12. $375x^3 - 3$
13. $x^2(2x-3) - (2x-3)$
14. $x^3(x-6) - 8(x-6)$
15. $5x^3 + 2x^2 - 45x - 18$
16. $3x^3 + 4y^3 - 4x^2y - 3xy^2$
17. $3x^4 - 5x^3 - 3x + 5$
18. $4x^4 - 3x^3 + 32x - 24$
19. $4x^5 - x^3 - 32x^2 + 8$
20. $7x^5 - 7x^3 - 28x^3y^2 + 28xy^2$

3.5 Factoring Trinomials

Do all work on notebook paper. All steps should be shown. All work should be neat and organized.

Factor completely.

1. $x^2-9x+14$
2. x^2-9x+8
3. x^2-x+7
4. x^2-6x+9
5. $3x^2+24x+21$
6. $-2x^3-16x^2-32x$
7. $x^2+6xy+5y^2$
8. $6x^2-13x-5$
9. $12x^2+25x-7$
10. $9x^2-15x+4$
11. $9x^2+30x+25$
12. $-2+17x+9x^2$
13. $6x^2-13x-15$
14. $20x^2-60x-35$
15. $15x^3+42x^2-9x$
16. $9x^2-16xy-4y^2$
17. x^4+2x^2-3
18. $4x^4+7x^2-2$
19. $6x^2+19x+15$
20. $10x^2-19x+6$

3.6 Factoring Summary

Do all work on notebook paper. All steps should be shown. All work should be neat and organized.

Factor Completely.

1. $2x^2+7x+3$
2. $x^2-7xy-8y^2$
3. $3(2x-1)^2-11(2x-1)-20$
4. $125x^3+8y^3$
5. $x^2-xy-12y^2$
6. $x^2+3xy-10y^2$
7. $18x^3y^3-6x^2y^4-4xy^5$
8. $x^2+10x+25$
9. $64x^3-1$
10. $2x^2-xy-3y^2$
11. $x^2+6xy+9y^2$
12. $4x^2+4x-3$
13. $25x^2-16y^2$
14. $x^2-10x+25-81y^2$
15. $3x^2-8xy+4y^2$
16. $(x-1)^2-4y^2$
17. $4x^2-24x+36$
18. $6m^5n^4+15m^3n^6-3m^2n^4$
19. $(x+4)^3+125y^3$

3.7 Solving Quadratic Equations by Factoring

Do all work on notebook paper. All steps should be shown. All work should be neat and organized.

Solve by factoring.

1. $x^2+6x+8=0$
2. $2x^2+12x-32=0$
3. $6x^2-2x=0$
4. $4x^2-9=0$
5. $2x^2-7x-4=0$
6. $6x^2-41x-7=0$
7. $12x^2-31x+9=0$
8. $x^2+5x-4=10$
9. $8x^2-13x-9=5x-4$
10. $3x^2+5x+20=2x^2-3x+4$
11. $9x^2+7x-7=3x(x-4)$
12. $3x^2-8x-31=(2x+3)(x-7)$
13. $(2x+5)(x-4)=(x+7)(x-4)$

3.8 Applications

Do all work on notebook paper. All steps should be shown. All work should be neat and organized.

Find the solutions.

1. *Find two consecutive even integers whose product is* 48.

2. *A positive number is* 5 *larger than another positive number. The sum of the squares of the two numbers is* 53. *Find the numbers.*

3. *Find two numbers whose difference is* 7 *and whose product is* -12.

4. The sum of the areas of two squares is 73 sq yd. The sides of the second square are 5 yd longer than the sides of the first square. What are the dimensions of each square?

5. *The base of a triangle is* 1 *in. more than twice the heigth. Find the base and the height if the area of the triangle is* 14 *sq in.*

6. *An arrow is shot vertically upward from the roof of a* $48 - ft - tall$ *building with a speed of* $88\ {}^{ft}/_{sec}$. *The equation that gives the arrows height above ground level is* $h = -16t^2 + 88t + 48$. *How high is the arrow after* 1 *sec? After* 3 *sec? When does it hit the ground?*

7. *An astronaut on the surface of the moon jumps off a* $41.6 - ft - tall\ cliff$. *The equation that gives the astronnauts height above lunar surface is* $h = -2.6t^2 + 41.6$. *When does the astronaut hit the lunar surface?*

8. *A square piece of tin,* 8 *in. on a side, has four equal squares cut from its corners (see figure* 3.8.3). *This new figure is to have an area of* 55 *sq in. What size squares should be cut to attain this area?*

Ch 4 Rational Expressions and Rational Equations

4.1 Integer Exponents

Do all work on notebook paper. All steps should be shown. All work should be neat and organized.

Evaluate each of the following. Your answers should have NO exponents.

1. $2^2 \cdot 2^3$
2. $\dfrac{(-7)^4}{(-7)^5}$
3. $(4^{-1})^{-2}$
4. -8^2
5. $(-8)^2$
6. -2^3
7. $(-2)^3$
8. $(-3)^{-4}$
9. -3^{-4}
10. $(-3)^{-3}$
11. -3^{-3}
12. $2^{-3}+4^{-1}$
13. $4^{-2}+3^{-1}$
14. $2^{-2}+4^{-1}$
15. $8^0+8^{-1}+8$
16. $5^0+5^{-1}+5$
17. $\left(\dfrac{2}{3}\right)^3$
18. $\left(\dfrac{5}{8}\right)^{-1}$
19. $\left(\dfrac{4}{3}\right)^{-2}$
20. $\dfrac{5^{-2}}{3^{-1}}$

Simplify each of the following. Your answers should have no NEGATIVE exponents.

21. $\left(\dfrac{8x^9y^3}{4x^3y^2}\right)^2$
22. $(3x^{-2}y^2)^{-1}(4xy^3)^{-2}$
23. $(8x^0y^{-4})^0$
24. $\left(\dfrac{2x^4}{5y^{-2}}\right)^3$
25. $\left(\dfrac{5x^{-3}y}{3x^2y^{-2}}\right)^3$
26. $\dfrac{8x^3y^{-2}}{10x^{-6}y^5}$
27. $\dfrac{2^{-2}x^{-3}y^{-4}}{8^{-1}x^{-1}y^{-2}}$
28. $\dfrac{\left(2x^3y^{-4}\right)^4}{\left(5x^0y^7\right)^2}$
29. $\dfrac{\left(-3x^4y^7\right)^3}{\left(2x^{-4}y^3\right)^{-4}}$
30. $\left(\dfrac{4^0x^{-2}y^6}{8x^3y^4}\right)^{-2}$

4.2 Reducing Rational Expressions

Do all work on notebook paper. All steps should be shown. All work should be neat and organized.

Reduce the following expressions to lowest terms.

1. $\frac{8x^4y^2}{6xy^3}$

2. $\frac{-9ab^2c^3}{4ab^3c}$

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

4. $\frac{3x+6y}{3x}$

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

6. $\frac{x^2+5x+6}{x^2-4x-21}$

7. $\frac{6x^2+7x-3}{4x^2-9}$

8. $\frac{6x^2+7x-5}{2x^2-x}$

9. $\frac{x^2+3x-10}{4-x^2}$

10. $\frac{4x^2-12x+9}{2x^2-11x+12}$

11. $\frac{3x^2+9x-30}{6x^2+30x}$

12. $\frac{2x^2+5x-12}{9-4x^2}$

13. $\frac{x^3+8}{3x^2+2x-8}$

14. $\frac{27x^3-1}{6x^2+4x-2}$

4.3 Multiplying and Dividing Rational Expressions

Do all work on notebook paper. All steps should be shown. All work should be neat and organized.

Perform the indicated operations and reduce to lowest terms.

1. $\frac{5xy^2}{7a^3b^4} \div \frac{3x^4y^7}{6a^2b^6} \cdot \frac{14x^5y^2}{15a^4b}$

2. $\frac{5x^3y^5}{8a^3b^2} \cdot \frac{14ab^7}{9xy^8} \div \frac{a^2b^2}{12xy}$

3. $\frac{2x+2}{5x-15} \cdot \frac{x-3}{xy+y}$

4. $\frac{10x^2y^2+5xy^2}{8-4x} \div \frac{6x+3}{12x-24}$

5. $\frac{10x^2+17x+3}{2x^2+7x+6} \div \frac{5x^2+41x+8}{2x^2+x-6}$

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

7. $\frac{6-23x-4x^2}{3x^2+10x-48} \cdot \frac{3x^2+x-24}{8x^2-6x+1}$

8. $\frac{3x^2-10x-8}{2x^2-3x-20} \cdot (2x+5)$

9. $\frac{x^3-8}{x^2+2x-3} \cdot \frac{3x^2-2x-1}{3x^2-5x-2}$

10. $\frac{x^3-1}{2x^2-11x+12} \cdot \frac{2x^2-3x-20}{8x^3+12x^2} \div \frac{2x^2+3x-5}{4x^2-9}$

4.4 Adding and Subtracting Rational Expressions

Do all work on notebook paper. All steps should be shown. All work should be neat and organized.

Perform the indicated operations and reduce to lowest terms.

1. $\frac{3}{2x}+\frac{7}{2x}$
2. $\frac{2n}{xy}-\frac{9n}{xy}$
3. $\frac{x}{4x-7}-\frac{3x+5}{4x-7}$
4. $\frac{5x+1}{2x^2+x-11}-\frac{2x+9}{2x^2+x-11}$
5. $\frac{x^2+2x}{x+1}+\frac{1}{x+1}$
6. $\frac{7x}{y-2}-\frac{3x}{2-y}$
7. $\frac{2x^2-8}{x-5}+\frac{x^2+x+12}{5-x}$
8. $\frac{2x^2-5}{x-1}-\frac{x^2+2}{1-x}$
9. $\frac{8}{5x}+\frac{3}{2y}$
10. $\frac{3}{4xy^2}+\frac{7}{3x^2y}$
11. $\frac{5}{x+2}+\frac{2}{x+3}$
12. $\frac{3}{2x+5}-\frac{5}{x-3}$
13. $\frac{x+2}{2x-3}-\frac{x-3}{x+6}$
14. $\frac{x-1}{2x+5}+\frac{3x-2}{2x-3}$
15. $\frac{2}{x^2-4x-5}+\frac{5}{x^2-2x-15}$
16. $\frac{4x}{3x^2-5x-2}-\frac{1}{3x^2+13x+4}$
17. $\frac{2x+3}{x^2-1}+\frac{x-2}{x^2-6x+5}$
18. $\frac{3x-5}{x^2-x-12}-\frac{x+1}{x^2+5x+6}$
19. $\frac{x-1}{6x^2-7x+2}+\frac{x+2}{2x^2-7x+3}$
20. $\frac{x+1}{4x^2+4x-15}-\frac{4x+5}{8x^2-10x-3}$

4.5 Complex Fractions

Do all work on notebook paper. All steps should be shown. All work should be neat and organized.

Simplify the following fractions.

1. $\dfrac{\frac{5}{7}}{\frac{45}{16}}$

2. $\dfrac{\frac{3x}{2y^2}}{\frac{5x^4}{4y^3}}$

3. $\dfrac{\frac{2x^2+3x}{y^2-y}}{\frac{8x^4+12x^3}{3y^3-3y^2}}$

4. $\dfrac{\frac{8xy-4y}{6xy^2}}{\frac{12x^2y-6xy}{9x^2y^2}}$

5. $\dfrac{2+\frac{3}{x}}{1-\frac{7}{x}}$

6. $\dfrac{\frac{2}{x}+\frac{2}{y}}{\frac{4}{x^2y^2}}$

7. $\dfrac{\frac{1}{x}-\frac{1}{y}}{\frac{1}{x^2}-\frac{1}{y^2}}$

8. $\dfrac{1-\frac{5}{2x}-\frac{3}{2x^2}}{2-\frac{15}{2x}+\frac{9}{2x^2}}$

9. $\dfrac{2x-y}{\frac{2}{y}-\frac{1}{x}}$

10. $\dfrac{1-\frac{1}{9x^2}}{1-3x}$

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

12. $\dfrac{\frac{\frac{1}{x}-\frac{1}{y}}{x-y}}{5}$

13. $\dfrac{\frac{4}{2+h}-2}{h}$

14. $\dfrac{\frac{4}{2x+1}+3}{\frac{5}{2x+1}-2}$

4.6 and 4.7 Division of Polynomials

Do all work on notebook paper. All steps should be shown. All work should be neat and organized.

Perform the indicated divisions using LONG division method.

1. $\dfrac{24x^2-62x+36}{4x-7}$
2. $\dfrac{40x^2-44x+17}{5x-3}$
3. $\dfrac{2x^3-13x^2-10x+19}{2x+3}$
4. $\dfrac{-19-8x+21x^2+12x^3}{4x+7}$
5. $\dfrac{4x^2-7}{2x-3}$
6. $\dfrac{4x^3-x-7}{2x-3}$
7. $\dfrac{6x^3+20x^2-19}{2x+6}$
8. $\dfrac{2x^4+x^3-3x^2+9x-13}{x^2+x-3}$

Perform the indicated divisions using SYNTHETIC division.

9. $\dfrac{x^2-3x+5}{x-2}$
10. $\dfrac{2x^3-7x^2-x+6}{x-3}$
11. $\dfrac{x^3-7x-4}{x+2}$
12. $\dfrac{3x^3+11x^2-5x}{x+4}$

(Hint: need a place holder for the constant)

13. $\dfrac{x^4-2x^3-5x^2+x+5}{x+2}$
14. $\dfrac{2x^4-3x^3+x^2+7x-5}{x-1}$
15. $\dfrac{6x^4-7x^3-11x^2+2x+3}{x-\frac{1}{6}}$

4.8 Rational Equations

Do all work on notebook paper. All steps should be shown. All work should be neat and organized.

Solve the following equations. Do not forget to check solutions.

1. $\frac{-3}{2x}=\frac{9}{8}$
2. $\frac{3}{2x}+\frac{1}{3x}=\frac{11}{12}$
3. $\frac{x+1}{2}=\frac{x-5}{4}$
4. $\frac{2}{2x-1}+\frac{3}{x-4}=\frac{5}{2x-1}$
5. $\frac{2}{x+1}-\frac{1}{3x-2}=\frac{3}{3x-2}$
6. $\frac{5}{2x+1}-\frac{1}{2x-1}=\frac{6}{4x^2-1}$
7. $\frac{1}{x}-\frac{2}{4x+1}=\frac{1}{8x^2+2x}$
8. $\frac{2x+1}{x-2}=\frac{2x+1}{x+2}+\frac{10}{x^2-4}$
9. $\frac{1}{x^2}-\frac{1}{6x}=\frac{1}{6}$
10. $\frac{5}{x^2}-\frac{1}{3x}=2$
11. $\frac{2}{2x-1}+\frac{x}{x+4}=\frac{36}{2x^2+7x-4}$
12. $\frac{4x}{x-1}-\frac{x}{x+3}=\frac{-12}{x^2+2x-3}$
13. $\frac{3x+6}{2x+5}=\frac{-1}{x}$
14. $\frac{x+3}{9x+1}=\frac{x+1}{7}$
15. $\frac{9x+3}{10x-30}=\frac{x}{x-3}$
16. $\frac{2}{x+3}+\frac{4}{x+1}=\frac{4}{3}$
17. $\frac{1}{x-5}-\frac{5}{x-2}=\frac{3}{2}$
18. $\frac{x+2}{2x-1}+\frac{x+5}{x+3}=\frac{5}{3}$

4.9 Applications-Rational Equations

Do all work on notebook paper. All steps should be shown. All work should be neat and organized.

Find the solutions to the following problems.

1. The sum of a number and its reciprocal is $\frac{25}{12}$. What is the number?

2. The sum of the reciprocals of two consecutive integers is $\frac{7}{12}$. What are the integers?

3. The sum of the reciprocals of two consecutive even integers is $\frac{7}{24}$. What are the integers?

4. Tameka can mow her yard in 2 hours. Her brother Dante can mow the yard in 3 hours. Working together, how long will it take them to mow the yard?

5. Brittany can prepare her report in $1\frac{1}{2}$ hours. Her co-worker, Firza, can prepare the report in 6 hours. Working together, how long will it take them to prepare the report?

6. Working together Debbie and Jim can clean the house in 4 hours. Working alone, Debbie can clean the house in 5 hours. How long does it take Jim to clean the house?

7. Working together, Elmer and his son can paint their house in 3 days. Working alone, Elmer can spray paint the house in 4 days. How long will it take his son, using a brush, to paint the house by himself?

8. Colonel Scanlon can fly his plane 300 mi with the wind in the same time that he can fly it 240 mi against the wind. If the speed of his plane is 180 mi/hr, what is the wind speed?

9. Maureen can fly her plane 250 mi with the wind in the same time that she can fly it 200 mi against the wind. If the speed of her plane is 90 mi/hr, what is the wind speed?

Ch 5 Exponential and Radical Expressions and Radical Equations

5.1 Rational Exponents

Do all work on notebook paper. All steps should be shown. All work should be neat and organized.

Evaluate each of the following, if possible.

1. $36^{1/2}$
2. $\left(\frac{25}{49}\right)^{1/2}$
3. $(-9)^{1/2}$
4. $-4^{1/2}$
5. $(-16)^{1/4}$
6. $-16^{1/4}$
7. $64^{1/3}$
8. $\left(\frac{-8}{125}\right)^{1/3}$
9. $-\left(\frac{27}{8}\right)^{1/3}$
10. $\left(\frac{-1}{32}\right)^{1/5}$
11. $4^{5/2}$
12. $-8^{2/3}$
13. $-\left(\frac{1}{16}\right)^{3/2}$
14. $49^{-1/2}$
15. $25^{-3/2}$
16. $(-49)^{-3/2}$
17. $-100^{-1/2}$
18. $\left(\frac{16}{81}\right)^{3/4}$
19. $25^{1/3}\cdot 25^{1/6}$
20. $\frac{27^{1/2}}{27^{1/6}}$

Simplify each of the following. Your answers should have no NEGATIVE exponents.

21. $x^{3/4}\cdot x^{1/12}$
22. $\left(4x^3\right)^{1/2}\cdot\left(8x^{1/3}\right)$
23. $\frac{2x^{-2/3}}{3x^{1/4}}$
24. $\frac{-6x^3y^{-1/2}}{4x^{1/3}y^2}$
25. $2x^{1/3}\cdot 5x^{1/6}$
26. $\left(\frac{-27x^{-1}}{8y^{-3/2}}\right)^{2/3}$
27. $\left(\frac{25x^3}{9y^{1/3}}\right)^{-1/2}$
29. $-5x^{1/4}\cdot 7x^{-2/3}$

5.2 Radicals

Do all work on notebook paper. All steps should be shown. All work should be neat and organized.

Evaluate each of the following, if possible.

1. $\sqrt{100}$
2. $\sqrt{\frac{121}{4}}$
3. $\sqrt[3]{27}$
4. $\sqrt[3]{-64}$
5. $\sqrt{-49}$
6. $\sqrt[3]{\frac{8}{27}}$
7. $\sqrt[3]{4^3}$
8. $\sqrt{13^2}$
9. $\sqrt[4]{\frac{1}{16}}$
10. $\sqrt[5]{\frac{32}{243}}$
11. $\sqrt[4]{-\frac{1}{81}}$
12. $\sqrt[5]{-32}$
13. $\frac{\sqrt{100}}{\sqrt{49}}$
14. $\frac{\sqrt[3]{27}}{\sqrt[3]{64}}$
15. $\sqrt{\sqrt{81}}$

Convert the following expressions to radicals.

16. $7^{2/3}$
17. $(-5)^{1/5}$
18. $(4xy)^{3/4}$
19. $(2x)^{1/2}$

Convert the following radicals to expressions with rational exponents. Simplify where possible.

20. $\sqrt{7}$
21. $\left(\sqrt[3]{x}\right)^8$
22. $\sqrt[4]{k^4}$
23. $\sqrt{\left(7x^3y\right)^6}$
24. $\sqrt[3]{a^{15}}$

5.3 Simplify Radical Expressions

Do all work on notebook paper. All steps should be shown. All work should be neat and organized.

Simplify the following radicals.

1. $\sqrt{48}$
2. $\sqrt{80}$
3. $\sqrt[3]{16}$
4. $\sqrt[4]{80}$
5. $\sqrt[3]{128x^7}$
6. $\sqrt{x^2y^2}$
7. $\sqrt{32x^7y^4}$
8. $\sqrt{144x^5y^7z^8}$
9. $\sqrt[3]{81x^9y^2z^4}$
10. $\dfrac{1}{\sqrt{3}}$
11. $\dfrac{\sqrt{3}}{\sqrt{12}}$
12. $\sqrt{\dfrac{3}{5}}$
13. $\dfrac{3}{\sqrt{6}}$
14. $\dfrac{5}{\sqrt{x}}$
15. $\dfrac{5}{\sqrt{8x}}$
16. $\sqrt[3]{\dfrac{1}{4}}$
17. $\sqrt[3]{\dfrac{1}{2}}$
18. $\sqrt{\dfrac{2}{9x}}$
19. $\sqrt{\dfrac{3}{7x}}$
20. $\sqrt{\dfrac{2x}{3y^3}}$
21. $\sqrt{\dfrac{8x^4}{5y^2}}$
22. $\sqrt[3]{\dfrac{7}{8x}}$
23. $\sqrt[3]{\dfrac{16}{3x^2}}$
24. $\sqrt[3]{\dfrac{3y^2}{5x^4}}$
25. $\sqrt{\dfrac{49x^3}{9y^3}}$

5.4 Adding and Subtracting Radical Expressions

Do all work on notebook paper. All steps should be shown. All work should be neat and organized.

Perform the indicated operations.

1. $3\sqrt{7}-5\sqrt{7}-8\sqrt{7}$
2. $2\sqrt{15x}-7\sqrt{15x}+5\sqrt{15x}$
3. $x\sqrt[3]{10y}-8x\sqrt[3]{10y}$
4. $5\sqrt{12}-2\sqrt{27}+3\sqrt{3}$
5. $5\sqrt{8}-\sqrt{18}+2\sqrt{32}$
6. $\sqrt[3]{32}+\sqrt[3]{108}$
7. $\sqrt{27x}-2\sqrt{12x}+2\sqrt{48x}$
8. $x\sqrt{18x}+5\sqrt{2x^3}+2x\sqrt{8x}$
9. $\sqrt{27x}+2\sqrt{12x}-\sqrt{150y}-4\sqrt{24y}$
10. $x\sqrt{20x^2}-x\sqrt{45}+2\sqrt{500}$
11. $\dfrac{1}{\sqrt{2}}+5\sqrt{2}$
12. $\dfrac{3}{\sqrt{5}}+\sqrt{80}$
13. $\dfrac{1}{\sqrt[3]{2}}-\sqrt[3]{108}$
14. $\sqrt{3}+\dfrac{5}{\sqrt{3}}+\dfrac{2\sqrt{27}}{3}$
15. $\sqrt{2}-\dfrac{4}{\sqrt{2}}-\dfrac{\sqrt{50}}{2}$

5.5 Operations with Radical Expressions

Do all work on notebook paper. All steps should be shown. All work should be neat and organized.

Perform the indicated multiplications and simplify your answers.

1. $\sqrt{3}\left(2+\sqrt{5}\right)$
2. $\sqrt{x}\left(3+\sqrt{x}\right)$
3. $\left(2+\sqrt{7}\right)\left(\sqrt{8}-3\right)$
4. $\left(\sqrt{5}+\sqrt{7}\right)\left(\sqrt{10}+\sqrt{2}\right)$
5. $\left(2\sqrt{3}+4\sqrt{5}\right)\left(3\sqrt{2}-6\sqrt{7}\right)$
6. $\left(2\sqrt{x}+3\sqrt{y}\right)\left(4\sqrt{x}+5\sqrt{y}\right)$
7. $\left(3\sqrt{2}-6\sqrt{3}\right)^2$
8. $\left(2\sqrt{x}+7\right)^2$
9. $\left(3-\sqrt{x+2}\right)^2$
10. $\left(\sqrt{5}-\sqrt{3}\right)\left(\sqrt{5}+\sqrt{3}\right)$
11. $\left(5\sqrt{3}+\sqrt{6}\right)\left(5\sqrt{3}-\sqrt{6}\right)$
12. $\left(3+4\sqrt{2x-6}\right)^2$

Rationalize the denominator of the following radicals.

13. $\dfrac{1}{\sqrt{3}+2}$
14. $\dfrac{2}{\sqrt{3}+\sqrt{5}}$
15. $\dfrac{x}{\sqrt{x}+\sqrt{y}}$
16. $\dfrac{2+\sqrt{3}}{2-\sqrt{3}}$
17. $\dfrac{\sqrt{x}+5}{\sqrt{x}-4}$
18. $\dfrac{\sqrt{3}+\sqrt{2}}{\sqrt{6}-\sqrt{3}}$
19. $\dfrac{\sqrt{x}+\sqrt{y}}{\sqrt{x}-\sqrt{y}}$
20. $\dfrac{5\sqrt{3}+7}{2\sqrt{3}-4}$

5.6 Radical Equations

Do all work on notebook paper. All steps should be shown. All work should be neat and organized.

Find the solutions(s) of the following radical equations.

1. $\sqrt{2x+1}=3$
2. $\sqrt{x^2+7}-4=0$
3. $\sqrt{3x-7}+2=0$
4. $\sqrt[3]{3x+1}=4$
5. $\sqrt[3]{3x^2-10x}+2=0$
6. $\sqrt[4]{3x+5}=-3$
7. $\sqrt{3x+40}=x$
8. $\sqrt{2x^2+2x-3}=x$
9. $\sqrt{4x^2-x-1}+1=2x$
10. $\sqrt{x^2-8x+26}+5=x$
11. $\sqrt{2x+5}-x=3$
12. $\sqrt{x+8}-x=-4$
13. $\sqrt{3x+5}+1=3x$
14. $\sqrt{3-x}-x=3$
15. $\sqrt{x-4}+x=6$
16. $\left(x^2+4x-5\right)^{3/2}=64$
17. $\left(2x^2-5x+6\right)^{3/2}=8$
18. $\sqrt{x+2}+\sqrt{x}=2$

5.7 Complex Numbers

Do all work on notebook paper. All steps should be shown. All work should be neat and organized.

Perform the indicated operations.

1. $-\sqrt{-121}$
2. $\sqrt{-9}+\sqrt{-16}$
3. $-\sqrt{50}+\sqrt{-12}$
4. $\sqrt{-21}\cdot\sqrt{-21}$
5. $5\sqrt{-12}\cdot\sqrt{6}$
6. $\dfrac{-\sqrt{-21}}{\sqrt{-1}}$
7. $\dfrac{\sqrt{-25}\sqrt{-49}}{\sqrt{-36}}$
8. $(2+3i)+(5-6i)$
9. $(-5-2i)-(3+i)$
10. $7(3+9i)$
11. $2i(4-7i)$
12. $(6+i)(3-4i)$
13. $(5-3i)(2-4i)$
14. $(2-5i)(2+5i)$
15. $(\sqrt{3}+i)(\sqrt{3}-i)$
16. $(2+3i)^2$
17. $(\sqrt{3}+i)^2$

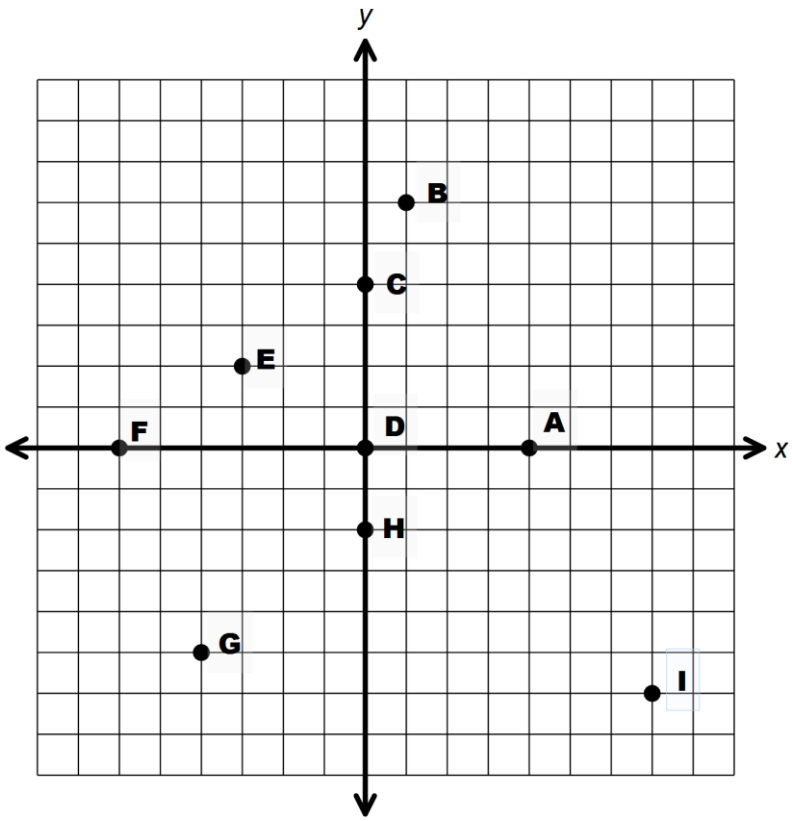
Rationalize the denominators.

18. $\dfrac{5}{3i}$
19. $\dfrac{5+3i}{i}$
20. $\dfrac{4+i}{2i}$
21. $\dfrac{1}{4+2i}$
22. $\dfrac{3}{2-3i}$
23. $\dfrac{2i}{1+3i}$
24. $\dfrac{-4i}{-3-5i}$
25. $\dfrac{3-4i}{3+i}$
26. $\dfrac{9-17i}{2-i}$
27. $\dfrac{-2-5i}{1-4i}$

Ch 6 Linear Relations and Functions

6.1 Cartesian Coordinate System

1. Find the ordered pairs associated with the given points:



Make a table of values and graph the following equations on graph paper provided. (next page)

2. $y = 2x - 3$

3. $x + 2y = 4$

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

5. $2x + 3y = 0$

6. $y = x^2 - 5$

7. $y = 9 - x^2$

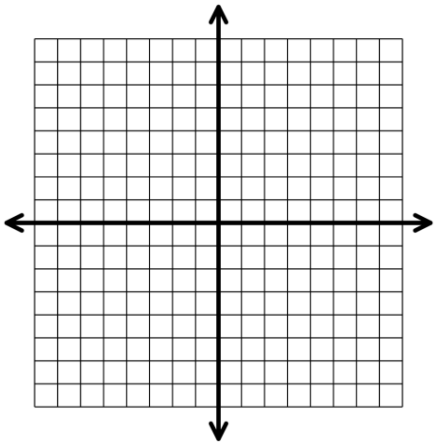
8. $x = 1 - y^2$

9. $y = \sqrt{x - 4}$

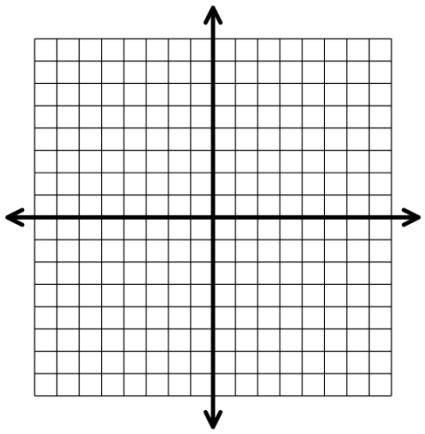
10. $y = \sqrt{x + 2}$

6.1 (Continued)

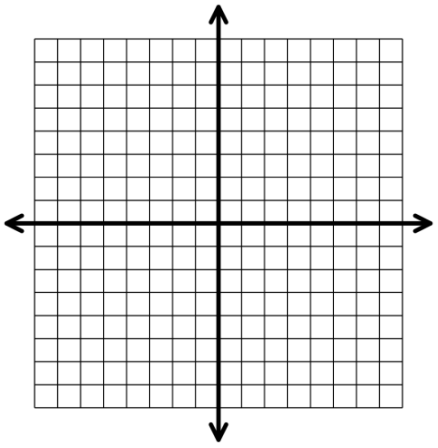
2. $y = 2x - 3$



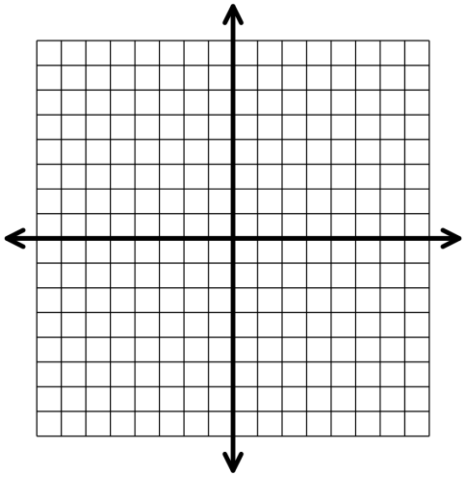
3. $x + 2y = 4$



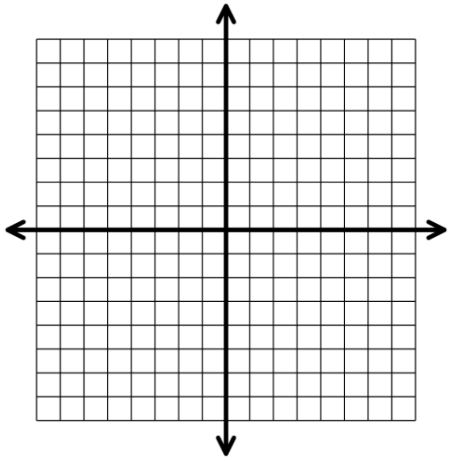
4. $\frac{1}{2}x + 2 = y$



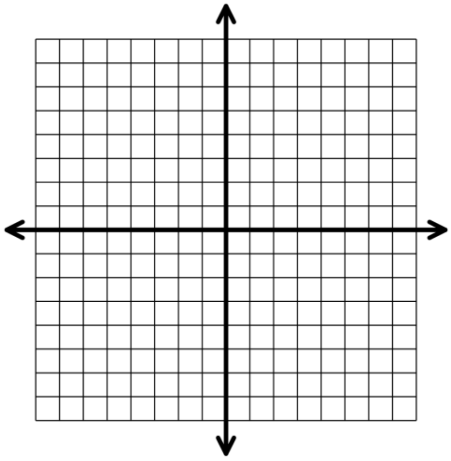
5. $2x + 3y = 0$



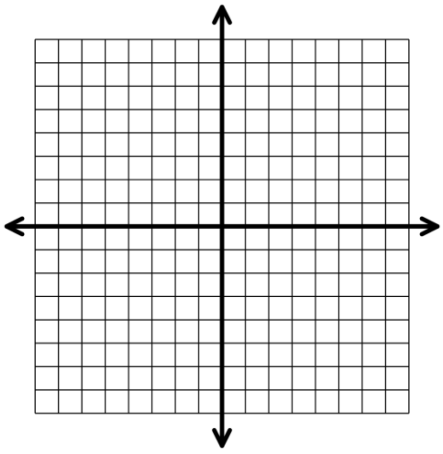
6. $y = x^2 - 5$



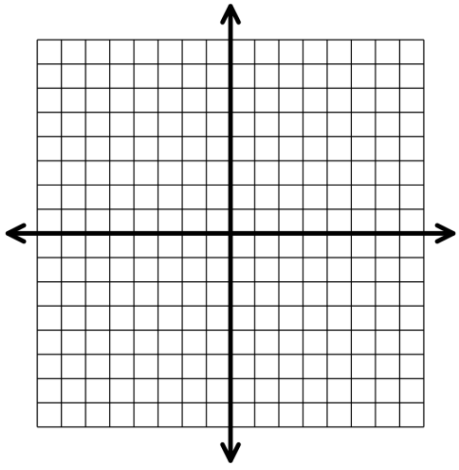
7. $y = 9 - x^2$



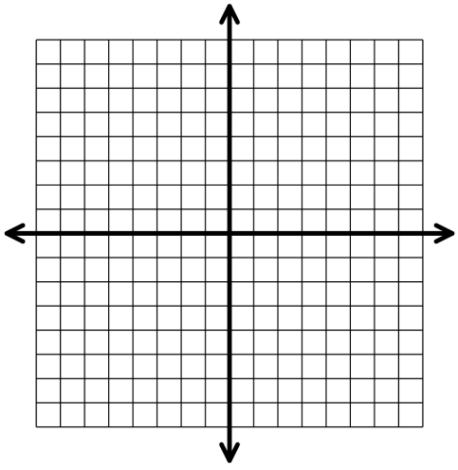
8. $x = 1 - y^2$



9. $y = \sqrt{x-4}$



10. $y = \sqrt{x+2}$



6.2 Relations and Functions

Do all work on notebook paper. All work should be neat and organized.

Write the following sets as sets of ordered pairs and identify the domain and range.

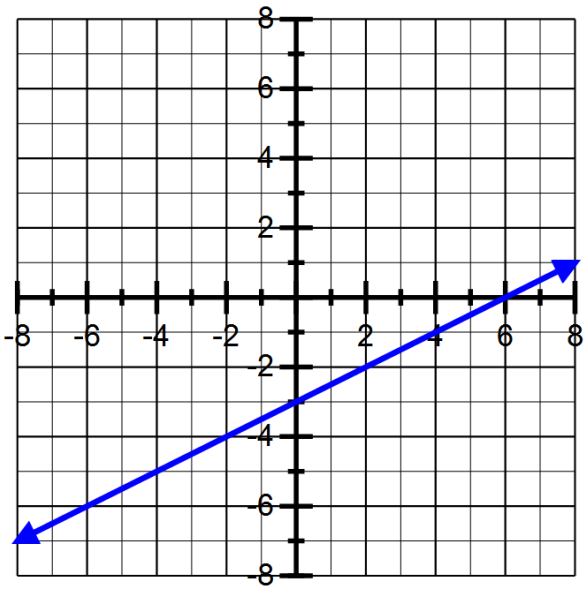
1. $V = \left\{(x, y) : y = -2x + 7, x = -5, 0, 2, 1, \frac{3}{2}\right\}$

2. $Z = \{(x, y) : y = |x| + 3, x = -2, 0, 2\}$

3. $X = \left\{(x, y) : y = \sqrt{2x - 1}, x = 1, 3, 5, \frac{1}{2}\right\}$

Determine the domain and range of each relation whose graph is given. Determine which of the following are graphs of functions.

4.



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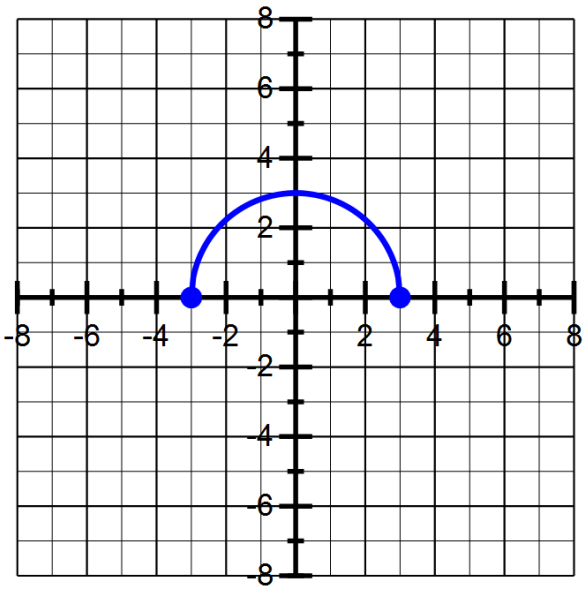
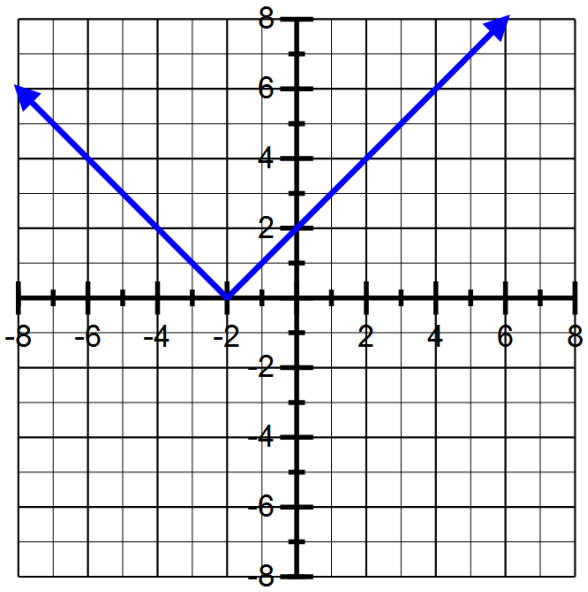


6.2 (Continued)

6.



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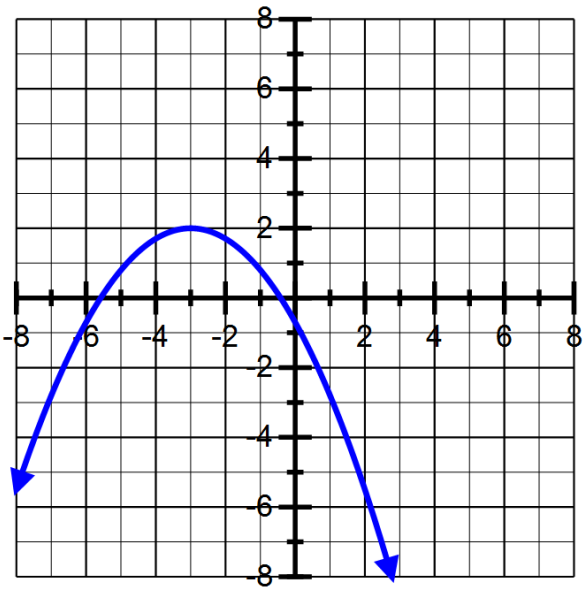

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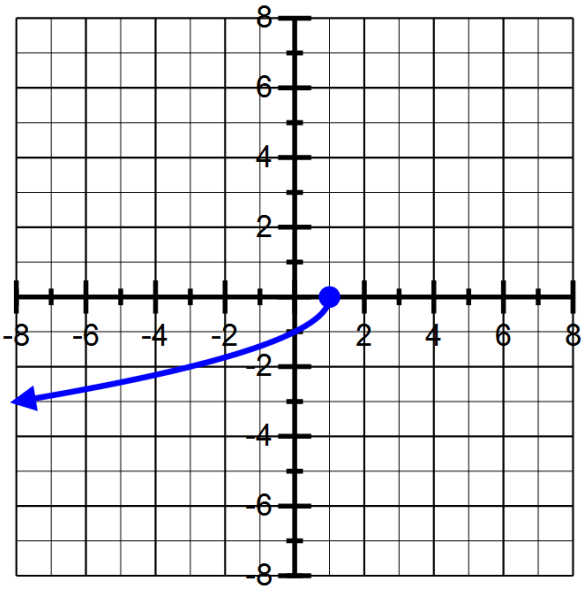

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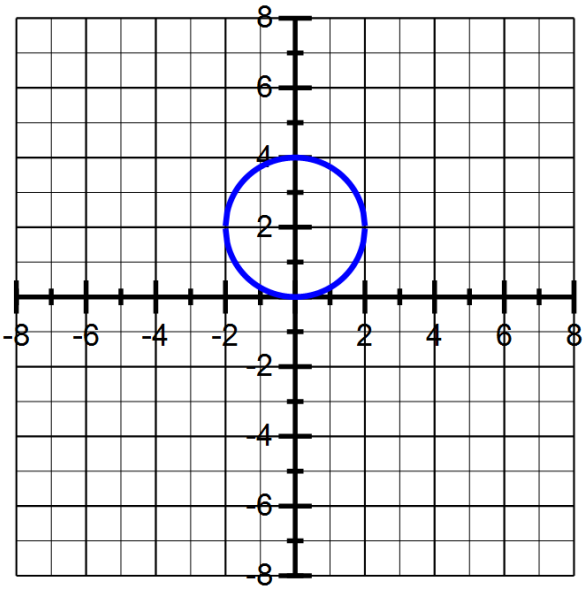

6.2 (Continued)

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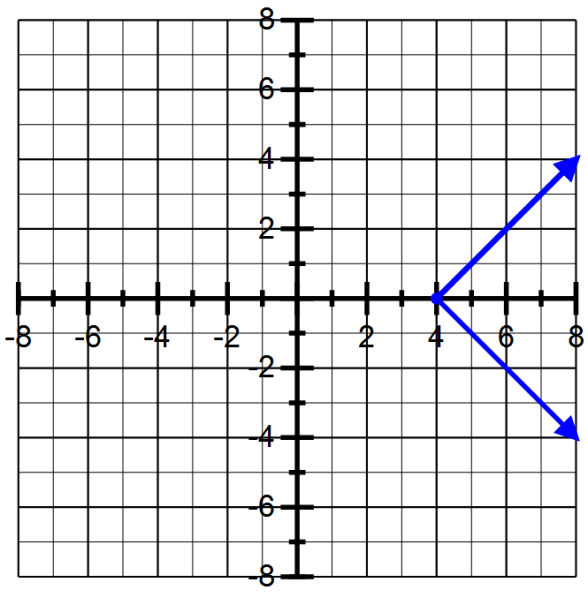

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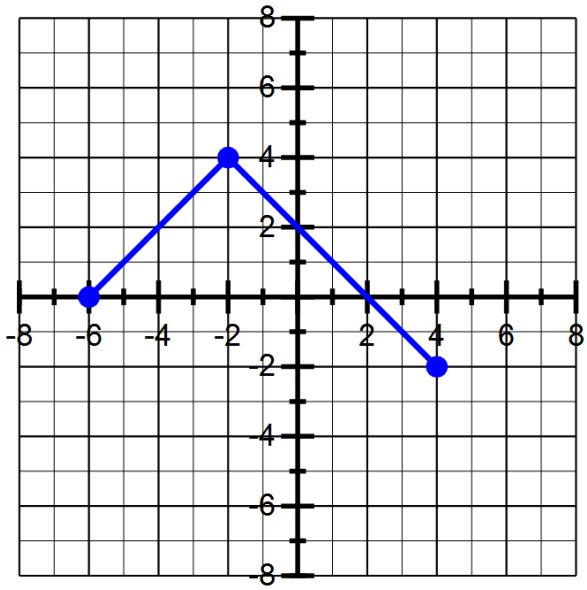

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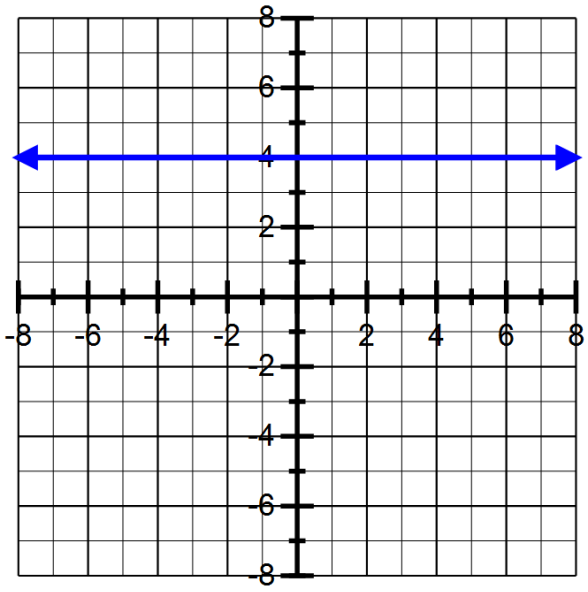

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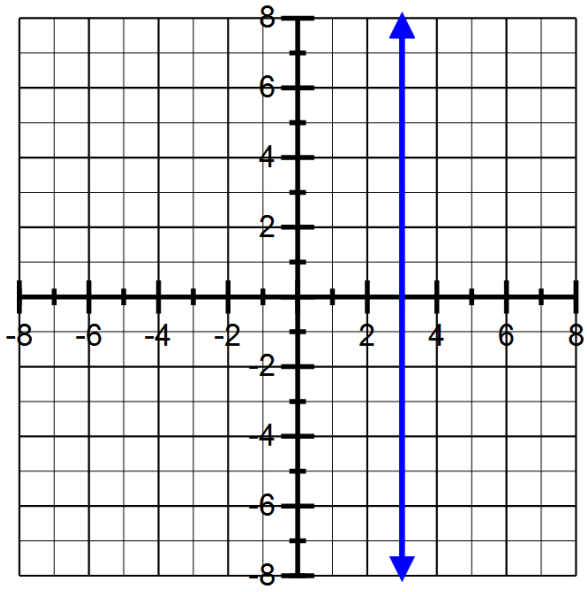
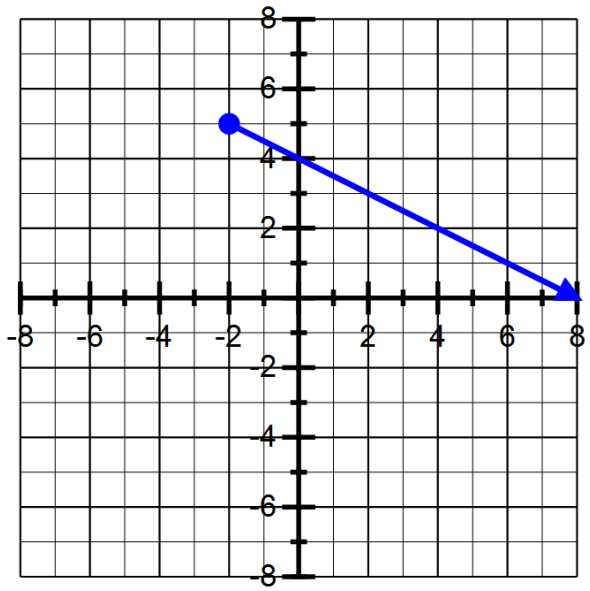


6.2 (Continued)

14



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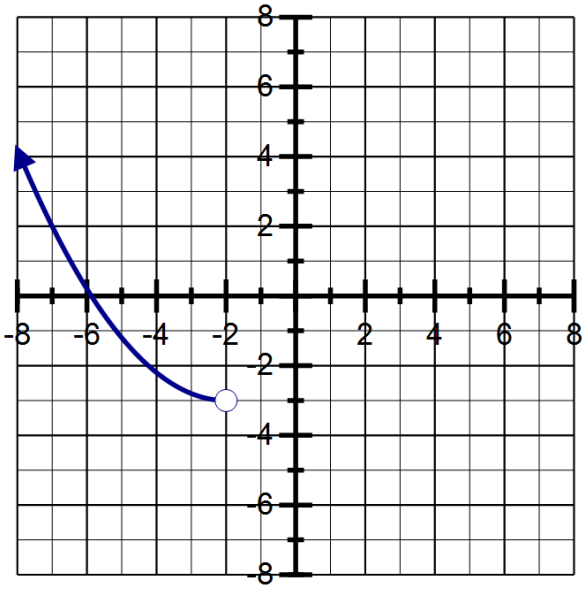

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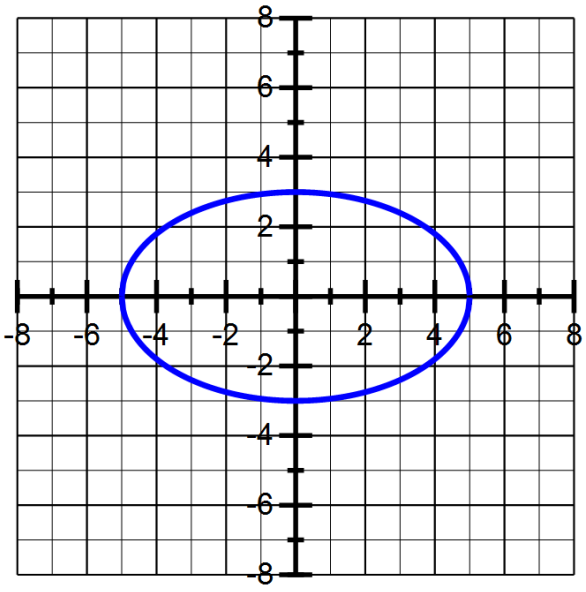

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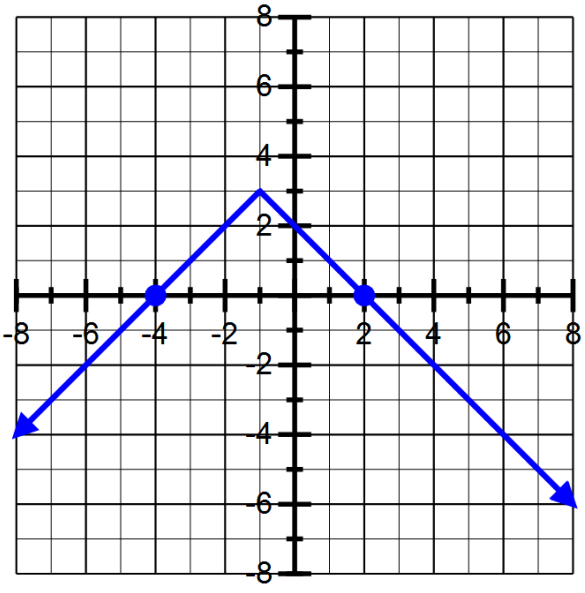
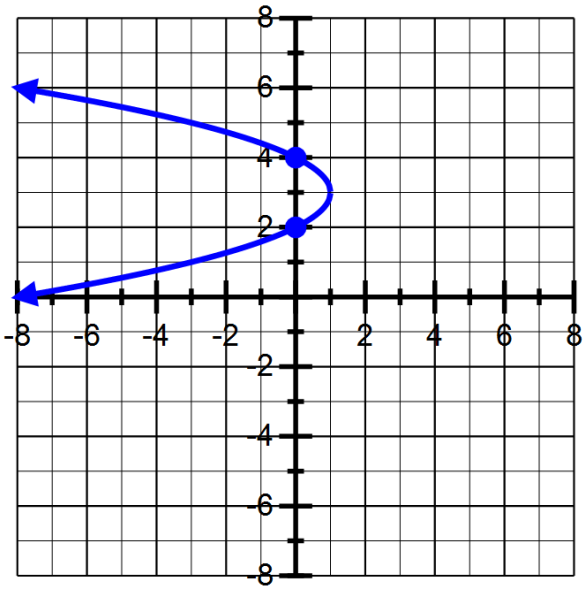


6.2 (Continued)

18.



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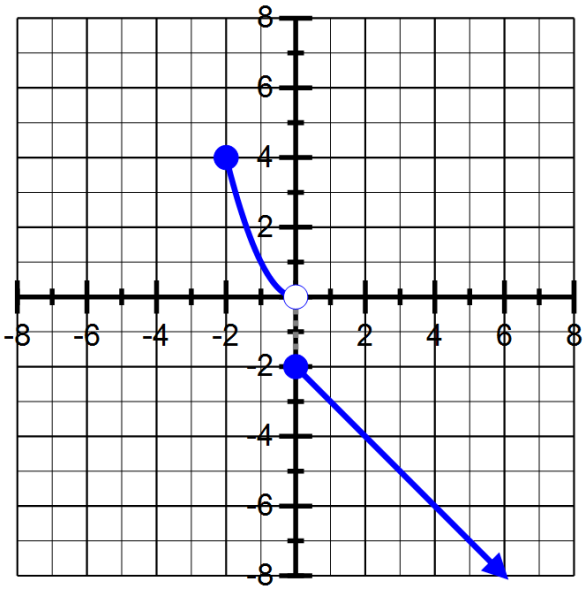


6.3 Function Notation and Combinations of Functions

Do all work on notebook paper. All steps should be shown. All work should be neat and organized.

For the given functions, find the following values:

$$f(-2),\ f(-1),\ f(0),\ f(1),\ f(a),\ f(a+h)$$

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

Find $(f+g)(x),\ (f-g)(x),\ (f\cdot g)(x),\ \left(\frac{f}{g}\right)(x)$.

6. $f(x)=2x^2+5x-1,\ \ g(x)=x-2$
7. $f(x)=x^2+5,\ \ g(x)=x^2-9$
8. $f(x)=2x+3,\ \ g(x)=x-11$
9. $f(x)=x^3+3x-5,\ \ g(x)=2x+1$

Let $f(x)=3x-1$, $g(x)=3x^2+5x-1$, $m(x)=x^2-4$, **and** $p(x)=2x+1$.
Find the following:

10. $f(-2)$
11. $m(-3)$
12. $5f(-2)+4m(-3)$
13. $[f(-2)]^3$
14. $g(3)$
15. $\left(\frac{m(-3)}{g(3)}\right)^2$
16. $(m\cdot p)(-1)$
17. $(g-f)(0)$
18. $g(x)-m(x)$
19. $\frac{m(x)}{p(x)}$
20. $g(2x)$
21. $p(3x)$
22. $f(a)$
23. $f(a+h)$
24. $\frac{f(a+h)-f(a)}{h}$
25. $g(a)$
26. $g(a+h)$
27. $\frac{g(a+h)-g(a)}{h}$

6.4 Linear Functions

Do all work on notebook paper. All steps should be shown. All work should be neat and organized.

Solve for y. Identify the slope and *y*-intercept.

1. $2x - y = 6$
2. $3x + 4y = 8$
3. $x + 3y = 0$
4. $-2x = 3y + 8$
5. $4y - 12 = 0$
6. $\frac{1}{3}y + \frac{3}{4}x - 2 = 0$

Find the *x*-intercept and *y*-intercept.

7. $3x + 4y = 6$
8. $4x - 5y = 10$
9. $5x - 3y = 0$
10. $y = 2x + 5$
11. $\frac{2}{3}y - \frac{1}{5}x = -3$

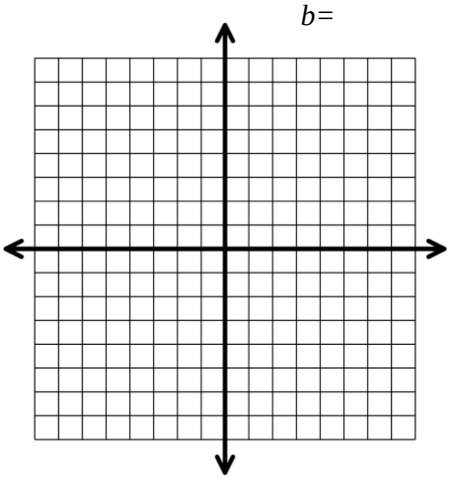
Find the slopes of the lines passing through the following points.

12. $(6,0)$ and $(0,-3)$
13. $(-4,1)$ and $(3,-5)$
14. $(3,-7)$ and $(6,2)$
15. $(5,2)$ and $(9,2)$
16. $(-3,1)$ and $(-3,10)$

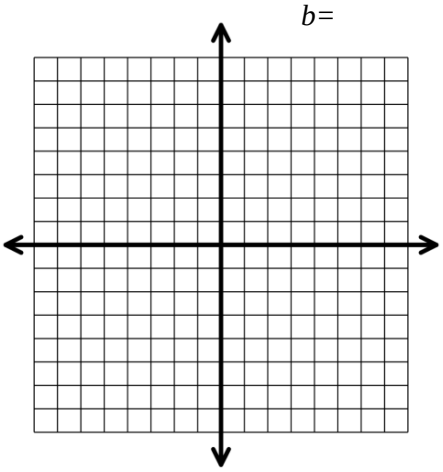
6.4 (Continued)

Graph the following lines. Find the slope and *y*-intercept.

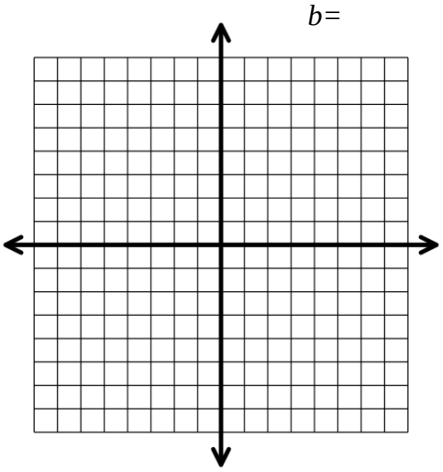
17. $3x-y=2$ $m=$ $b=$



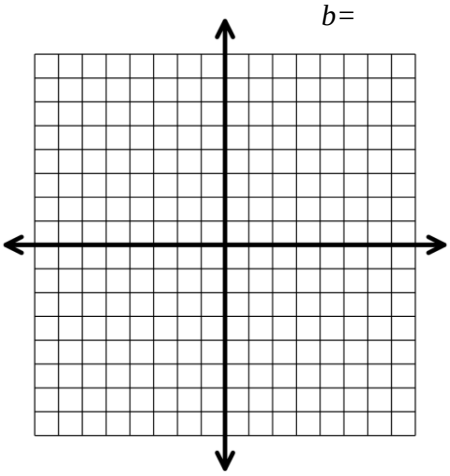
18. $x+2y=4$ $m=$ $b=$



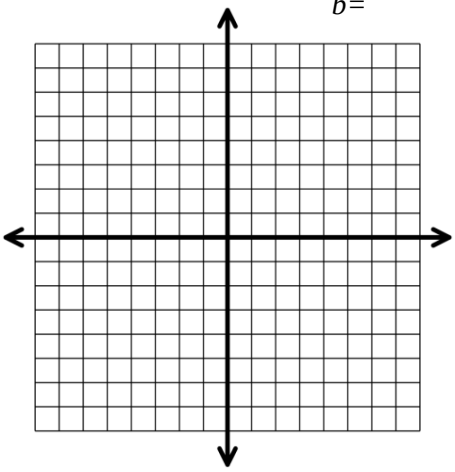
19. $4y-3x=8$ $m=$ $b=$



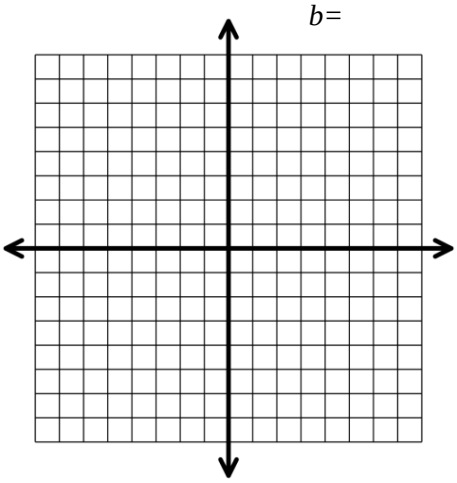
20. $3x+5y=0$ $m=$ $b=$



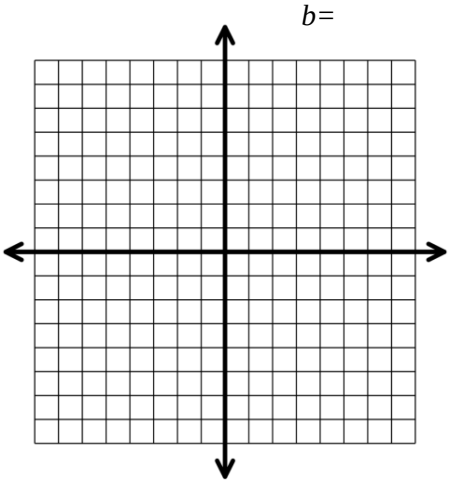
21. $y=-2x+\frac{5}{2}$ $m=$ $b=$



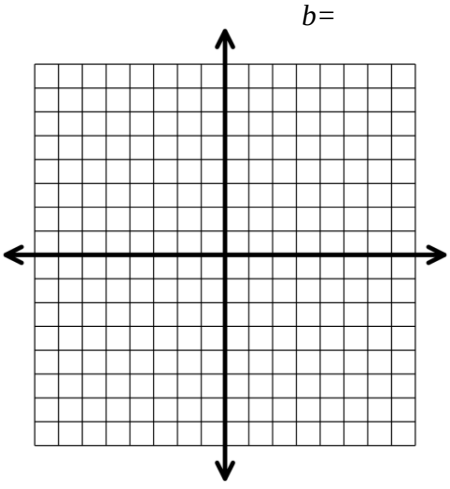
22. $y=4$ $m=$ $b=$



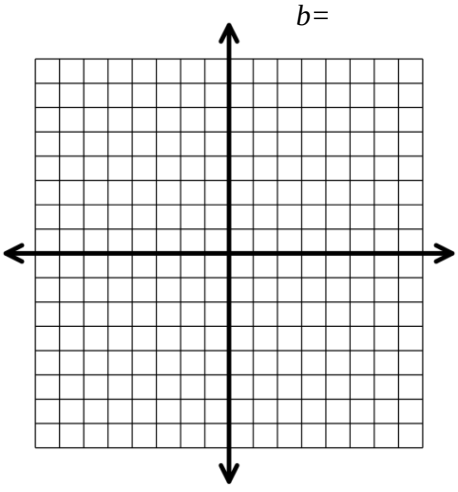
23. $x=-3$ $m=$ $b=$



24. $3y+6=0$ $m=$ $b=$



25. $5x-15=0$ $m=$ $b=$



6.5 Equations of Lines

Do all work on notebook paper. All steps should be shown. All work should be neat and organized.

Find the equations of the following lines. Write answers in slope-intercept form.

1. $m = 5$; y-intercept $= \frac{1}{2}$
2. $m = 1$; y-intercept $= -9$
3. $m = \frac{1}{2}$; y-intercept $= -3$
4. $m = 0$; y-intercept $= 11$
5. $m = 0$; y-intercept $= \frac{2}{5}$

Find the equations of the following lines. Write answers in slope-intercept form when possible.

6. $m = 3$; through $(-1,-2)$
7. $m = \frac{9}{2}$; through $(3,8)$
8. $m = -\frac{2}{3}$; through $(5,3)$
9. $m = 0$; through $(4,-12)$
10. m is undefined; through $(3,7)$

Find the equations of the lines passing through the given points. Write answers in slope-intercept form when possible.

11. $(-2,4)$ and $(-5,7)$
12. $(-8,6)$ and $(4,-3)$
13. $(0,0)$ and $(-2,3)$
14. $(8,-4)$ and $(-3,-4)$
15. $(5,3)$ and $(5,-6)$

6.5 (Continued)

Do all work on notebook paper. All steps should be shown. All work should be neat and organized.

Find the equations of the lines passing through the given points parallel to the given line. Write answers in slope-intercept form when possible.

16. Through $(1,-2)$; parallel to $y=3x+4$

17. Through $(3,11)$; parallel to $5x+4y=-8$

18. Through $(-2,5)$; parallel to $3x-7y=21$

19. Through $(3,-7)$; parallel to $y=12$

20. Through $(-8,-9)$; parallel to $x=5$

Find the equations of the lines passing through the given points perpendicular to the given line. Write answers in slope-intercept form when possible.

21. Through $(-1,2)$; perpendicular to $y=3x+4$

22. Through $(3,11)$; perpendicular to $3x-5y=-10$

23. Through $(-2,5)$; perpendicular to $4x+3y=21$

24. Through $(3,-7)$; perpendicular to $y=4$

25. Through $(-8,-9)$; perpendicular to $x=-7$

2.2 Linear Inequalities

Find and graph the solutions of the following inequalities. Express your answers using interval notation.

1. $4x-2>-10$
2. $-6-2x>-x$
3. $\frac{1}{5}x-3\le\frac{5}{4}-\frac{3}{2}x$

Find and graph the solutions of the following inequalities. Express your answers using interval notation.

4. $-7<x-4<1$
5. $5<2-3x<11$

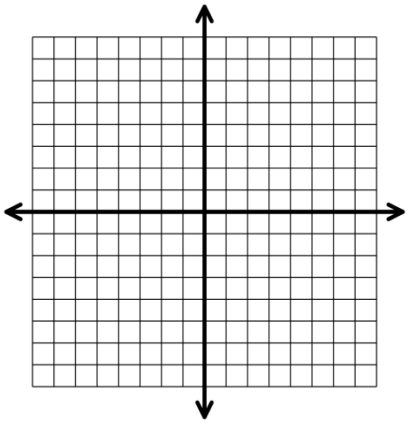
Find and graph the solutions of the following compound inequalities. Express your answers using interval notation.

6. $5x-2<4 \text{ and } 2x+7>3$
7. $x-1\le 4 \text{ or } 1-x\le 4$

6.7 Linear Inequalities in Two Variables

Solve for y, if possible. Identify the slope and y-intercept. Graph.

1. $y-2x<6$

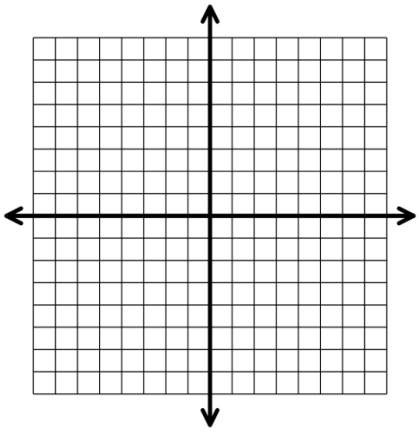


y _____

$m=$_____

$b=$_____

2. $3x+2y\geq 12$

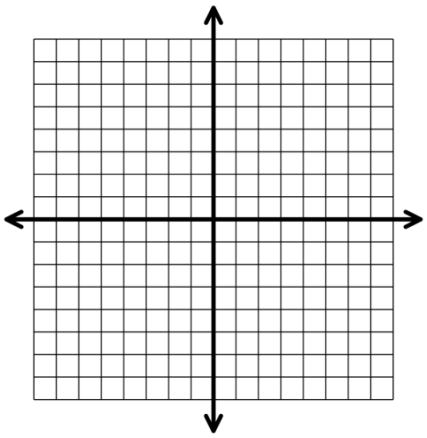


y _____

$m=$_____

$b=$_____

3. $y\leq \frac{1}{3}x-1$

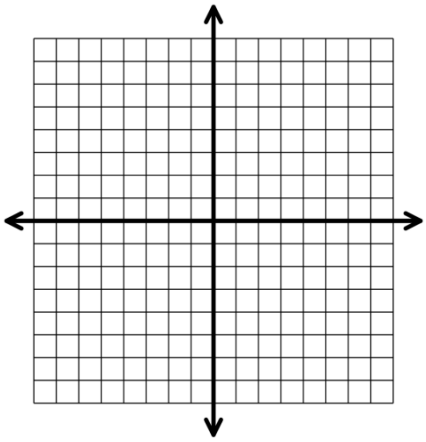


y _____

$m=$_____

$b=$_____

4. $y>4x-5$

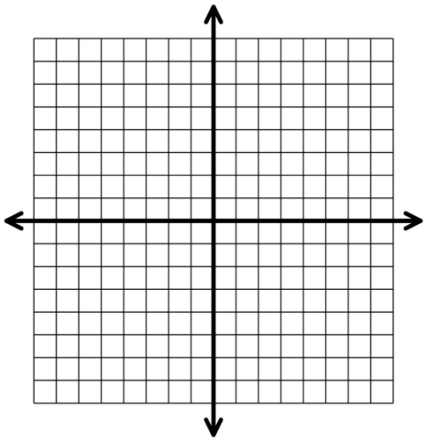


y _____

$m=$_____

$b=$_____

5. $4x\leq 2y-6$

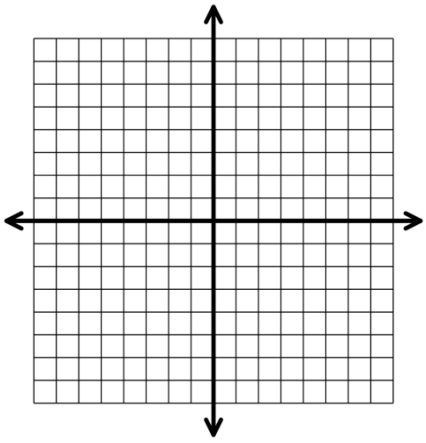


y _____

$m=$_____

$b=$_____

6. $7<3x-y$



y _____

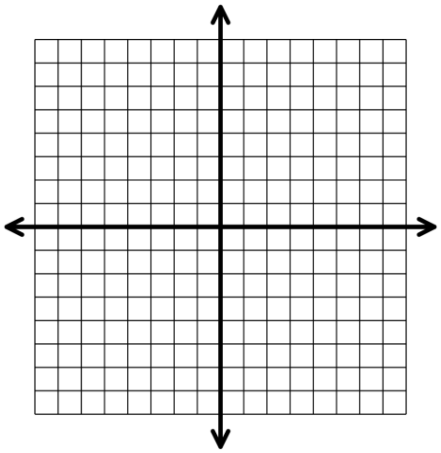
$m=$_____

$b=$_____

6.7 (Continued)

Solve for y, if possible. Identify the slope and y-intercept. Graph.

7. $5x > -3y + 9$

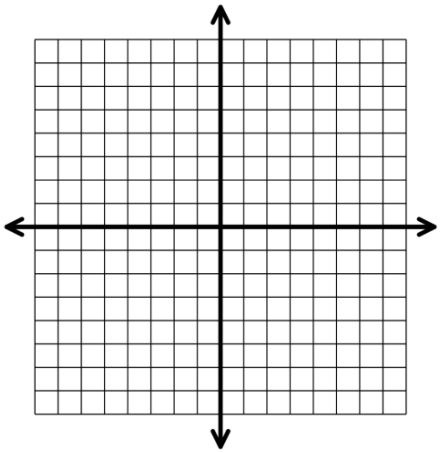


y _____

$m =$ _____

$b =$ _____

8. $-2y \le 7x - 8$

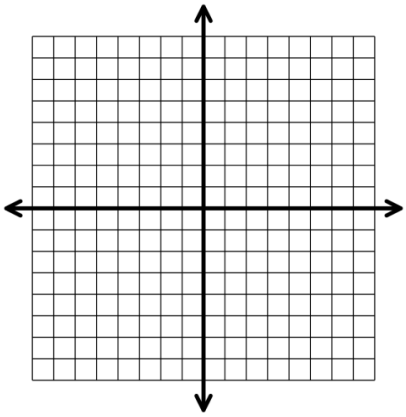


y _____

$m =$ _____

$b =$ _____

9. $2x > 3y$

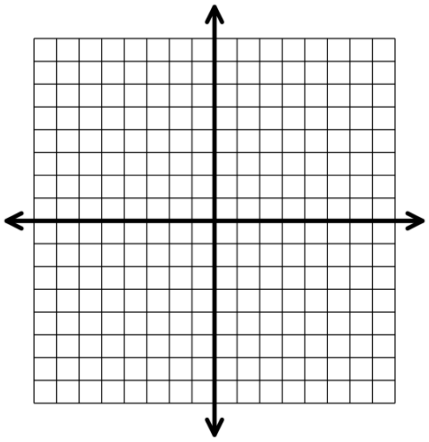


y _____

$m =$ _____

$b =$ _____

10. $x + 4y \ge 0$

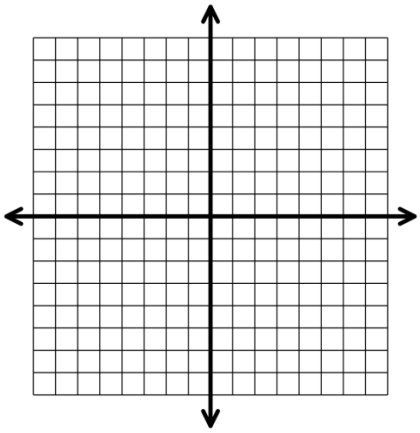


y _____

$m =$ _____

$b =$ _____

11. $y < 3$

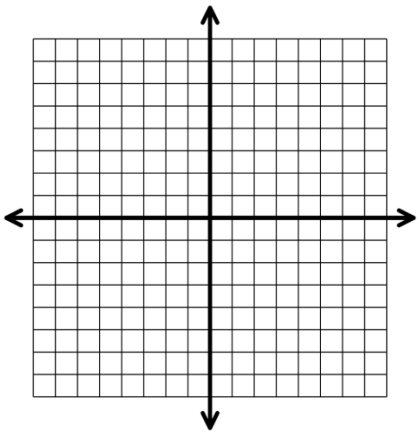


y _____

$m =$ _____

$b =$ _____

12. $x \ge -5$



y _____

$m =$ _____

$b =$ _____

Ch 7 Solving Quadratic Equations

7.3 Extraction of Roots Method and Completing the Square Method

Do all work on notebook paper. All steps should be shown. All work should be neat and organized.

Use the Extraction of Roots method to find the solutions of the following quadratic equations.

1. $x^2 = 25$
2. $x^2 = 80$
3. $x^2 = -121$
4. $x^2 - 64 = 0$
5. $4x^2 + 81 = 0$
6. $9x^2 - 49 = 0$
7. $5x^2 - 8 = 0$
8. $7x^2 - 2 = 0$
9. $2x^2 - 3 = 8$
10. $(2x-7)^2 = 6$
11. $(4x-5)^2 = 9$
12. $(x-1)^2 = -75$
13. $(3x+5)^2 = 27$
14. $(5x+1)^2 = 50$

Find the solutions of the following quadratic equations by completing the square.

15. $x^2 + 4x - 1 = 0$
16. $x^2 - 2x - 7 = 0$
17. $x^2 + 4x + 29 = 0$
18. $x^2 - 2x + 37 = 0$
19. $x^2 + 5x - 2 = 0$
20. $4x^2 + 4x - 2 = 0$
21. $2x^2 - 5x - 4 = 0$
22. $4x^2 - 4x + 17 = 0$
23. $4x^2 + 12x + 7 = 0$

7.4 Quadratic Formula

Do all work on notebook paper. All steps should be shown. All work should be neat and organized.

Use the quadratic formula to find the solutions of the following quadratic equations.

1. $x^2+9x-9=0$
2. $9x^2+2x-2=0$
3. $8x^2+10x+1=0$
4. $6x^2+2x+5=0$
5. $x^2+6x-8=0$
6. $8x^2-x+2=0$
7. $4x^2-6x-9=0$
8. $2x^2+8x+7=0$
9. $4x^2+4x+3=0$
10. $8x^2-4x-5=0$
11. $x(2x+3)=7$
12. $2x(x+3)=-1$
13. $(x+5)(3x-1)=4$
14. $\frac{1}{2}-\frac{1}{x}-\frac{1}{x^2}=0$