

Algebra 1 Problem Set 91 Linear Inequalities

Graph the following linear inequalities.

1. $y < 2x - 3$ 2. $y \geq -x + 6$ 3. $x + 3y < 9$ 4. $2y - x \leq 8$
5. $y > -3$ 6. $x \leq 7$ 7. $y \geq x$ 8. $x > 2 - y$

Solve the following.

9. $x^2 - 8 = 0$ 10. $(x + 3)^2 = 1$ 11. $\left(x - \frac{2}{3}\right)^2 = 9$ 12. $x^2 - 9 = 1$
13. $x^2 + 2x = 48$ 14. $5x^3 - 125x = 0$ 15. $x^2 = 5x + 84$ 16. $24 = 5x + x^2$
17. A bag contains 15 gray stones, 12 striped stones, 9 speckled stones and 14 black stones. What is the probability of drawing 2 striped and one speckled stone from the bag?
a) with replacement b) without replacement
18. Two dice are rolled three times. What is the probability that the sum of the numbers is a six each time?
19. A coin is tossed twelve times. What is the probability that it will land on head on the fifth toss?
20. The ratio of jelly beans to bird eggs was 12 to 5. If there were 156 jelly beans, how many bird eggs were there?
21. Seventy three percent of Janet's serves were in. If 54 serves were out, how many total serves did she hit?
22. Write the equation of the line whose slope is -8 and y-intercept is (0,6).

Solve.

23. $\begin{cases} n + d = 15 \\ 5n + 10d = 110 \end{cases}$ 24. $\begin{cases} p = q + 10 \\ p + 25q = 322 \end{cases}$ 25. $\frac{3}{4} - \frac{x+1}{3} = \frac{5}{6}$
26. Divide: $\frac{x^2 + 16x + 63}{x^2 + 7x - 18} \div \frac{x^2 + 8x + 7}{x^2 + x - 6}$ 27. Simplify. $\frac{-(-9) \pm \sqrt{(-9)^2 - 4 \cdot 6(-6)}}{2 \cdot 6}$
28. The surface area of a sphere is $144\pi \text{ in}^2$. What is the sphere's volume?

Convert the following.

29. 0.26 square miles to square yards 30. 7200 millimeters to inches

Algebra 1**Problem Set 93****Completing the Square**

Solve each quadratic equation by completing the square.

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

2. $x^2 + 4x - 21 = 0$

3. $x^2 - 6x - 16 = 0$

4. $x^2 + 2x = 20$

5. $x^2 + 4x = 15$

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

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

8. $x^2 + 16 = 12x$

9. $x^2 = 20x + 10$

Solve each of the following equations using the most appropriate method.

10. $2x^2 + 7x = 15$

11. $3x^2 + 24 = 22x$

12. $38x^2 + 10x^3 + 24x = 0$

13. $4x^3 - 100x = 0$

14. $10x + 5x^2 = 315$

15. $\frac{x}{2} = \frac{3x + 10}{x - 2}$

16. $15 - 3(x - 6) = 6(x - 2) - 4x$

17. $2\frac{2}{3}x - \frac{5}{6} = 3\frac{1}{2}$

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

Graph each linear inequality.

19. $y > -2x + 4$

20. $3y - 2x \neq -15$

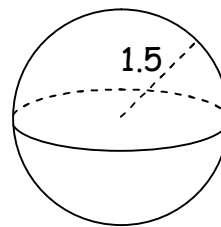
21. What is the probability of drawing 2 Jacks and 2 tens from an ordinary deck of 52 playing cards:

a) with replacement?

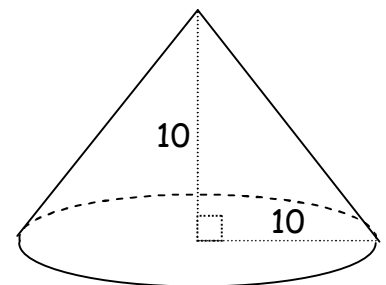
b) without replacement?

22. A ball of cookie dough, with a radius of 1.5 centimeters, is rolled in sugar. Find the surface area of the dough ball.

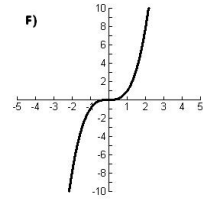
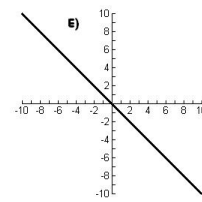
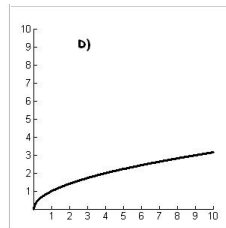
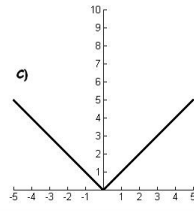
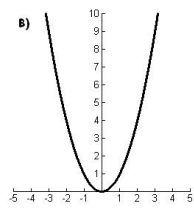
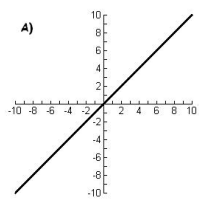
Find the volume of the dough ball.



23. At the highway maintenance facility sand and salt are mixed together and then travel along a conveyor belt. When the mixture falls off the conveyor it forms a conical pile. To protect the mixture it is covered with a tarp. What is the necessary area of the tarp? What is the volume of the pile? Dimensions are in feet.



Match each graph with an equation:



24a) $y = |x|$

b) $y = \sqrt{x}$

c) $y = x^3$

d) $y = x$

e) $y = x^2$

Simplify:

25. $\frac{x^3 - 2x^2 - 15x}{2x^2 + 14x + 24} \div \frac{3x^3 - 27x^2 + 60x}{6x^2 - 96}$

26. $\sqrt[6]{64} + \sqrt[3]{64} \pm \sqrt{64}$

27. $\frac{\frac{3x+2y}{x^3y^5}}{\frac{3x+2y}{x^5y^3}}$

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

29. Evaluate $\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

If $a = 6$, $b = 5$, and $c = -6$

30. Solve: $\begin{cases} 3x + 5y = 0 \\ 4x + 2y = -14 \end{cases}$

Algebra 1

Problem Set 94

The Quadratic Formula

Use the quadratic formula to solve each of the following equations.

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

2. $x^2 - 9x + 20 = 0$

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

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

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

6. $3x^2 = 2 + 4x$

Complete the square to solve each of the following equations.

7. $x^2 + 8x + 15 = 0$

8. $x^2 = 4x + 6$

9. $x^2 + 10x = 2$

Solve each of the following equations using the most appropriate method.

10. $2x^2 + 6x = 0$

11. $4x^2 - 36 = 0$

12. $10x^2 + 2x^3 = 12x$

13. $5x^2 = 3 + 14x$

14. $4x^2 - 4x = 3$

Simplify:

15. $\frac{2x^2 - 5x - 12}{3x^2 + 4x - 4} \cdot \frac{3x^2 + 10x - 8}{x^2 - 16}$

16. $\frac{2x^2 - 5x}{x^3 - 2x^2 - 24x} \div \frac{8x^2 - 4x - 40}{6x^2 + 22x - 8}$

17. There were 40 ping pong balls in the hopper. Five of them were red. To win the jackpot Rick had to close his eyes, reach in, and one at a time pick all five red balls. What is the probability that Rick will win the jackpot?
18. The game of backgammon is played with each contestant rolling a pair of regular six-sided dice. To win the game Jack had to roll double sixes, followed by double fours. What is the probability that Jack will win the game?
19. The wall measured 6 feet wide by 8 feet tall. How many one-inch square tiles would be required to cover the wall?
20. The box measured 10 inches wide, 14 inches long, and 12 inches tall. What is the surface area of the box?
21. For his magic act Hector entered a see-through circular cylinder that had a radius of 2.5 feet, and a height of 9 feet. What is the volume of the cylinder?

Graph each linear inequality.

22. $y \leq \frac{2}{3}x - 6$

23. $3y + 6x \leq 18$

Simplify:

24. $\frac{12x^4y^5 + 18x^3y^6}{4x^2y^4 + 6xy^5}$

25. $\frac{(2xy^{-2})^2}{x^{-3}y} \cdot \frac{xy^2}{(-2x^2y^{-3})^3}$

26. $\frac{(8 \times 10^{-14})(12 \times 10^8)}{(6 \times 10^{-6})}$

27. Find the equation of the line that passes through the two points (5, -7) and (-3, 5).

Solve:

28. $2(x - 8) + 3^2 - \sqrt[5]{32} = -(4x + 5)$

29. $\frac{w}{8} - \frac{4w - 3}{6} = \frac{5}{3}$

30. Add like terms: $\frac{3(ab)^2}{b^5} - \frac{7a^{-4}b^3}{(a^{-2}b^2)^3} + \frac{3a^4}{a^2b^3} + \frac{(4a^{-2}b)^2}{(-2ab)^3}$

Algebra 1 Problem Set 95 Value/Coin 2 Equation Word Problems

Write equations for each situation and solve:

- A coin purse contains \$1.35 in nickels and dimes. In all there are 15 coins. How many of each kind are there?
- Andy has 4 times as many quarters as nickels. In all, he has \$3.15. How many coins of each type does he have?

3. Brianna has \$6.05 in quarters and dimes. She has 8 more dimes than quarters. Find the number she has of each coin.
4. Joslynn bought 100 stamps for \$8.00. Some were 5-cent stamps. The rest were 10-cent stamps. How many of each kind did she buy?
5. David purchased football tickets through an advance sale that were \$15 each. He bought more tickets at the gate that were \$20 each. If he purchased a total of 38 tickets for \$650, how many tickets did he buy at the gate?
6. Buying flowers for Mother's day, Kiyer bought 6 more marigold plants than petunias. If the total bill was \$102 for marigolds that cost \$3 each and petunias that cost \$4 each, how many of each type of flower did she buy?
7. The length of a rectangle is 3 times its width. The perimeter of the rectangle is 72 feet. Find the dimensions of the rectangle.
8. The perimeter of a rectangular tennis court is 228 feet. If the length of the court is 6 more than twice the width, find its dimensions.

Solve using quadratic formula:

9. $3x^2 + 10x + 8 = 0$ 10. $2x^2 + 9x - 5 = 0$ 11. $5x^2 = 3x + 2$

Solve by Completing the Square:

12. $x^2 + 2x = 8$ 13. $x^2 - 9 = 6x$ 14. $x^2 - 4x + 3 = 0$

Solve using the Square Root Method:

15. $(x - 5)^2 = 49$ 16. $x^2 - 6 = 6$ 17. $x^2 - 36 = 0$

Solve by factoring.

18. $3x^2 - 17x - 28 = 0$ 19. $2x^3 = 72x$ 20. $3x^3 - 9x^2 - 120x = 0$

Graph the following:

21. $y \leq 2x - 5$ 22. $2x + 3y > 6$ 23. $3x - 5y = 10$

Simplify:

24. $\frac{x^2 + 7x - 8}{x^2 - 2x + 1} \cdot \frac{x^2 + 4x + 3}{x^2 + 11x + 24}$ 25. $\sqrt[4]{16} + \sqrt[3]{8} - 4^2 + \sqrt[5]{-243}$ 26. $\left(\frac{3x^4y}{m^{-2}}\right)^{-2}$

27. Find the complement and the supplement of an angle that is 81° .

28. Solve: $3(4x - 5) + |-10| = -2(x - 8)$

29. Add: $\frac{3ax}{m} + \frac{10x}{km^2} + \frac{2}{k^2m}$

30. Solve: $\frac{p}{6} - \frac{p+2}{4} = \frac{1}{3}$

Algebra 1

Problem Set 96

Rationalize Square Root Denominators

Simplify:

1. $\frac{6}{\sqrt{3}}$

2. $\frac{10}{\sqrt{5}}$

3. $\frac{8}{\sqrt{2}}$

4. $\frac{9}{\sqrt{6}}$

5. $\sqrt{\frac{1}{3}}$

6. $\sqrt{\frac{2}{5}}$

7. $\sqrt{\frac{5}{6}}$

8. $\sqrt{\frac{3}{4}}$

Write two equations and solve:

9. Ayla has \$2.80 in quarters and dimes. The number of dimes is 7 less than the number of quarters. Find the number she has of each kind.
10. Will put \$75 in quarters and dimes in a sock. There were 400 more dimes than quarters. How many of each type of coin were there in the sock?
11. Kaitlyn's sister broke a jar with 450 nickels and quarters. If the value was \$62.50, how many coins of each type were in the jar?
12. The larger of two numbers is 6 more than the smaller. The sum of the smaller number and the larger is 100. Find the numbers.
13. Chocolate chip cookies cost \$2 per pound. Sugar cookies were \$1.50 per pound. If we purchased 10 more pounds of chocolate chip cookies than sugar cookies, and spent a total of \$125, how many pounds of each type of cookie did we buy?
14. The width of a rectangle is 3 inches less than its length. The perimeter of that rectangle is 130 inches. Find the length and width of the rectangle.

Solve using quadratic formula:

15. $x^2 = 5x + 14$

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

Solve by Completing the Square:

17. $x^2 + 10x = 4$

18. $12x + 7 = x^2$

Solve by factoring.

19. $16x^2 - 9 = 0$

20. $4x^2 - 25x + 25 = 0$

21. $2x^3 - 11x^2 = 6x$

Simplify:

22. A vase contains 12 orange, 8 red, and 6 yellow roses. What is the probability of drawing 2 red roses followed by one yellow rose from the vase?

a) with replacement

b) without replacement

23. Rolling two dice, what is the probability that the sum of the numbers is an eight and then a sum of 9?

24. Find the volume and surface area of a sphere with radius of 4 centimeters.

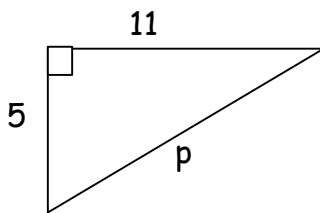
25. Divide: $\frac{3x^2 + 6x}{x^2 + 2x - 3} \div \frac{6x^3 + 12x^2}{x^2 - 5x + 4}$

26. Solve: $\frac{y}{2} - \frac{1}{4} = \frac{y}{6}$

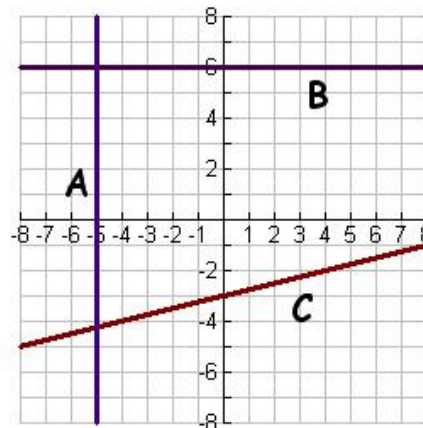
27. Simplify: $\frac{(7 \times 10^{11})(6 \times 10^{-3})}{(20 \times 10^5)}$

28. Simplify: $3\sqrt{2} \cdot 4\sqrt{3} \cdot 5\sqrt{12} + 2\sqrt{8}$

29. Find P;



30. Find the equations of lines a, b, and c:



Algebra 1 Problem Set 97 Graphing Quadratics

Accurately graph the following equations using a data-table and the pattern for quadratics:

1. $y = x^2$

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

3. $y = (x - 5)^2$

4. $y = x^2 + 3$

5. $y = x^2 - 7$

6. $y = -x^2$

Simplify:

7. $\frac{5}{\sqrt{20}}$

8. $\frac{16}{\sqrt{8}}$

9. $\frac{12}{\sqrt{3}}$

10. $\sqrt{\frac{4}{5}}$

11. $\sqrt{\frac{10}{11}}$

12. $\frac{15\sqrt{3}}{\sqrt{5}}$

13. $8\sqrt{2} + 5\sqrt{2} - 2\sqrt{2}$

14. $3\sqrt{40} - \sqrt{90}$

15. $2\sqrt{3}(3\sqrt{5} - 2\sqrt{20} - \sqrt{45})$

Write two equations and solve:

16. The width of a rectangle is six less the length. The perimeter is 84 centimeters. Find the dimensions of the rectangle.

17. The sum of two numbers is 101. Their difference is 11. Find the numbers.

18. The cost of three tennis balls and two golf balls is \$3.70. The cost of six tennis balls and three golf balls is \$6.30. Find the cost of one tennis ball and the cost of one golf ball.

19. Taylor has 80 coins, all nickels and dimes, with a total value of \$5.00. Find the number of each kind of coin.

Solve using quadratic formula:

20. $-x = 7 - x^2$

21. $x^2 = x + 6$

Solve by Completing the Square:

22. $x^2 + 6 = -10x$

23. $x^2 - 6x - 16 = 0$

Solve by factoring.

24. $2x^2 - 11x - 21 = 0$

25. $3x^2 + 5x = 2$

Simplify:

26. $(2x + 1)(9x + 2)$

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

28. Find the volume and surface area of a cylinder with radius of 4 centimeters and a height of 15cm..

29. Find the equation of the line which contains the point (2, 5) and has a slope of 3.

30. Solve: $\frac{x}{5} - \frac{5x}{9} + 24 = 0$

Algebra 1 Problem Set 98 Graphing Quadratics w Transformations

Accurately graph the following equations by finding the vertex and then using the pattern for graphing quadratics:

1. $y = x^2$

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

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

4. $y = x^2 + 7$

5. $y = x^2 - 2$

6. $y = -x^2$

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

8. $y = (x - 1)^2 + 4$

9. $y = -(x + 3)^2 + 5$

Simplify:

10. $\frac{6 + \sqrt{2}}{\sqrt{5}}$

11. $\frac{24}{\sqrt{12}}$

12. $\sqrt{\frac{6}{15}}$

13. $\frac{2 + \sqrt{5}}{\sqrt{8}}$

Write two equations and solve:

14. The length of a rectangle is twelve less than twice its width. The perimeter is 102 centimeters. Find the dimensions of the rectangle.

15. The cost for expensive tickets was \$12 each. The cheaper tickets cost \$8 each. If the total cost spent on 72 tickets was \$704, how many expensive tickets were purchased?

16. Erika has 200 coins, all nickels and pennies, with a total value of \$6.20. Find the number of each kind of coin.

Graph the following equations or inequalities:

17. $3y - 2x \leq 6$

18. $y + 5x > 3$

19. $4x - 6y = 18$

Solve the quadratics - try factoring first - if that does not work - use the Quadratic formula or

Complete the square to solve:

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

21. $3x^2 + 17x - 6 = 0$

22. $4x^2 = 25$

23. $x^2 + 6 = -12x$

24. $4x^2 + 7x - 3 = 0$

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

Convert:

26. 60 gallons to cups

27. 600 square miles to square meters

Simplify:

28. $\frac{\frac{3x^4y^3}{6xy}}{\frac{9x^4y}{12xy^2}}$

29. $(3ab^4)^{-2}(-3a^3b^5)^3$

30. $(6x^2 + 2x - 9) - (3x^2 - 8x + 2) + (x + 1)$

Algebra 1**Problem Set 99****Quadratic Applications**

Find the vertex of each parabola, and then graph the parabola.

1. $y = x^2 - 5$

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

3. $y = (x + 4)^2 - 7$

4. $y = -(x - 6)^2 + 8$

5. $y = (x - 4)^2 - 9$

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

An object is propelled vertically into the air. The object's height above the ground, $h(t)$, measured in feet, is given by each of the following equations. t is the number of seconds since the object was launched. In each situation find the maximum height the object attains, and tell how many seconds it takes the object to reach that height.

7. $h(t) = -16(t - 2)^2 + 80$

8. $h(t) = -16(t - 3)^2 + 150$

9. $h(t) = -16(t - 2.5)^2 + 110$

10. $h(t) = -16(t - 3.5)^2 + 215$

Solve each quadratic equation. Try factoring first. If the equation is not factorable, then either complete the square or use the quadratic formula.

11. $9x^2 = 49$

12. $x^2 + 40 = 13x$

13. $x^2 + 14 = 8x$

14. $2x^2 = 12 + 5x$

15. $3x^2 + 2x = 1$

16. $2x^2 = 10 + x$

An object is propelled vertically into the air. The object's height above the ground, $h(t)$, measured in feet, is given by each of the following equations. t is the number of seconds since the object was launched. In each situation find the time it takes the object to return to the ground. (When the object hits the ground, $h(t) = 0$.)

17. $h(t) = -16t^2 + 16t + 32$

18. $h(t) = -16t^2 + 48t + 32$

19. $h(t) = -16t^2 + 32t + 48$

20. $h(t) = -16t^2 + 16t + 16$

Simplify:

21. $\frac{8}{\sqrt{12}}$

22. $\sqrt{\frac{7}{8}}$

23. $\frac{4 + \sqrt{8}}{\sqrt{12}}$

24. $\frac{\frac{8x^5y}{x+y}}{\frac{2x^2y^4}{x+y}}$

25. Jeremy had 4 more quarters than dimes. The total value of his coins was \$5.55. How many coins of each type did he have?

26. To help replenish the community food bank, when Jenny went to the grocery store she bought 100 canned food items. The soup she bought cost \$0.79 per can and the canned spaghetti she bought cost \$0.98 per can. If she spent \$90.02 on these canned food items, how many of each did she buy?

27. Add: $\frac{1}{x} + \frac{3}{x+1} - \frac{4}{x-1}$

28. Add: $3(2x^2 - 7x + 1) - 2(x^2 + 4x - 3) + (x - 7)$

29. Solve: $\frac{2x-8}{5} = \frac{7x+3}{4}$

30. Solve: $5(2x - 3) - (4x - 2) = 7x - 9 - 2(5x + 4)$

1. One week Josh made a long trip in 8 hours. The next week it took 10 hours to make the same trip. This was because the first week he was able to drive 8 miles per hour faster. Find his speed for each of his two trips.
2. Joe ran the course in 3 hours. It took Ted 4 hours to jog the same course. If Joe ran 2 miles per hour faster than Ted jogged, how long was the course?
3. It took Janet four hours to get to the celebration. When the celebration was over, because the traffic was so heavy it took her an extra hour to get back home because she had to drive 10 miles per hour slower. How fast was she able to drive home?
4. The small plane made the trip in 8 hours. The jet took three hours less to make the same trip because it could travel 150 miles per hour faster than the small plane. Find the rate of each, and the distance of the trip.
5. To practice for the duathlon Jerry rode his bicycle at 20 miles per hours and then ran back home at 8 miles per hour. If the round trip took him 7 hours, how many hours did he run?
6. Deb took 4 hours to get to her destination. It only took her 3 hours to return home because she was able to drive 12 miles per hour faster. How far was it to her destination?

Find the vertex of each parabola, and then graph the parabola.

7. $y = -x^2 + 7$

8. $y = (x + 7)^2$

9. $y = (x - 5)^2 - 9$

An object is propelled vertically into the air. The object's height above the ground, $h(t)$, measured in feet, is given by each of the following equations. t is the number of seconds since the object was launched. In each situation find the maximum height the object attains, and tell how many seconds it takes the object to reach that height.

10. $h(t) = -16(t - 1.5)^2 + 42$

11. $h(t) = -16(t - 3)^2 + 145$

Solve each quadratic equation. Try factoring first. If the equation is not factorable, then either complete the square or use the quadratic formula.

12. $x^2 + 3x = 54$

13. $x^2 + 4x = 20$

14. $2x^2 + x = 5$

An object is propelled vertically into the air. The object's height above the ground, $h(t)$, measured in feet, is given by each of the following equations. t is the number of seconds since the object was launched. In each situation find the time it takes the object to return to the ground. (When the object hits the ground, $h(t) = 0$.)

15. $h(t) = -16t^2 + 64t + 80$

16. $h(t) = -16t^2 - 16t + 16$