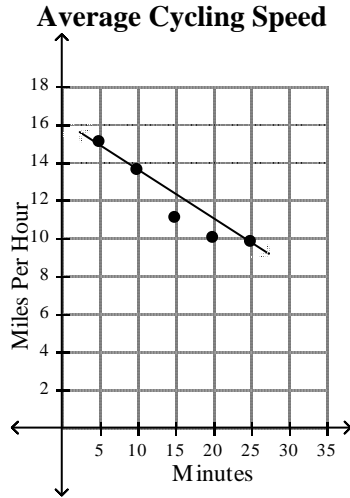


# GEOMETRY-Pre-Course Test Packet

## Multiple Choice

Identify the letter of the choice that best completes the statement or answers the question.



- \_\_\_ 1. Use the scatter plot that shows the average cycling speed as time passes. Use the points (5, 15) and (25, 10) to write the slope-intercept form of an equation for the line of fit shown in the scatter plot.  
a.  $y = -0.25x + 16.25$  b.  $x = -0.25y + 16.25$  c.  $y = 0.25x + 16.25$  d.  $y = -3.95x + 16.25$
- \_\_\_ 2. Use the scatter plot that shows the average cycling speed as time passes. Predict the speed of the cyclist after 30 minutes.  
a. about 6.2 miles per hour b. about 8.8 miles per hour c. about 12.3 miles per hour d. about 10.5 miles per hour

Find the solution set for the inequality using the given replacement set.

- \_\_\_ 3.  $x - 2 < 11$ ; {11, 12, 13, 14, 15}  
a. {11, 12} b. {12} c. {11} d. {11, 12, 13}

Solve the inequality.

- \_\_\_ 4.  $3.4d + 9.9 < -3.2d$   
a.  $-1.5 > d$  b.  $-16.5 < d$  c.  $-15.0 > d$  d.  $49.5 < d$
- \_\_\_ 5.  $0.3(2j + 2) > 2.4 - (-0.4j - 3)$   
a.  $j > 24$  b.  $j > 4.8$  c.  $\emptyset$  (the empty set) d.  $j > -6$
- \_\_\_ 6.  $-2f < 18$   
a.  $f < 20$  b.  $f > -36$  c.  $f < -9$  d.  $f > -9$
- \_\_\_ 7.  $3a + 3 - 6a > 15$   
a.  $a < -6$  b.  $a > 4$  c.  $a < -4$  d.  $a > -4$

\_\_\_ 8.  $\frac{-3b}{8} > -3$   
a.  $b > -24$  b.  $b > -\frac{8}{3}$  c.  $b > 8$  d.  $b < 8$

*Name the property used in the equation. Then find the value of n.*

\_\_\_ 9.  $11n = 11$   
a. Multiplicative Identity; 1 b. Multiplicative Identity; 0 c. Additive Identity; 1 d. Multiplicative Inverse; 1

*Solve the equation. Then check your solution.*

\_\_\_ 10.  $k + 1.5 = 8.4$   
a. 6.9 b. 12.6 c. 9.9 d. -6.9

\_\_\_ 11.  $-4.2 = -2.1n$   
a. 2 b. -2 c. 2.1 d. -6.3

\_\_\_ 12.  $-\frac{2}{5} + a = \frac{1}{5}$   
a.  $\frac{3}{5}$  b.  $-\frac{1}{5}$  c.  $\frac{3}{10}$  d.  $-\frac{3}{5}$

\_\_\_ 13.  $2x + 7 = 79$   
a. 36 b. 43 c.  $32\frac{1}{2}$  d. -36

*Find the sum.*

\_\_\_ 14.  $-1.4 + 2.3$   
a. -0.9 b. 0.9 c. -3.7 d. 3.7

*Find the product.*

\_\_\_ 15.  $(6c + 9)(6c - 9)$   
a.  $36c^2 - 81$  b.  $36c^2 + 54c - 81$  c.  $12c$  d.  $36c^2 + 81$

\_\_\_ 16.  $40(-50)$   
a. 90 b. 2000 c. -10 d. -2000

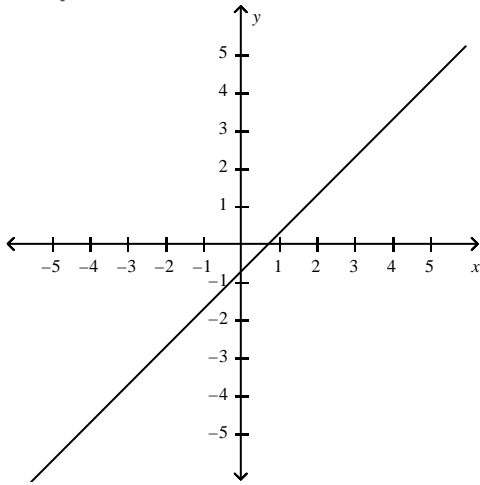
\_\_\_ 17.  $(-0.761)(6.2)$   
a. -6.961 b. 4.7182 c. -4.7182 d. 5.439

\_\_\_ 18.  $(4r - 9)^2$   
a.  $16r^2 - 72r + 81$  b.  $16r^2 + 81$  c.  $16r^2 - 72r - 81$  d.  $16r^2 - 81r + 81$

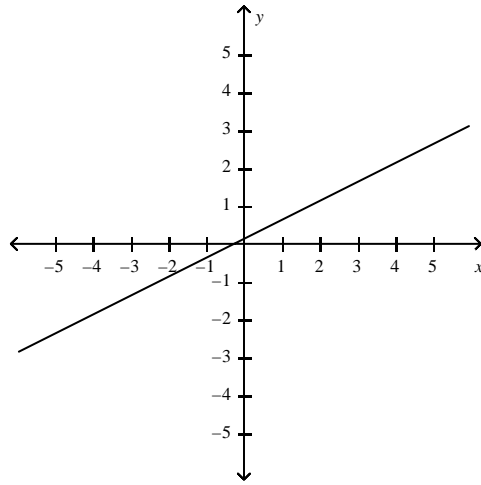
Graph the equation.

19.  $-4x + 4y = +1$

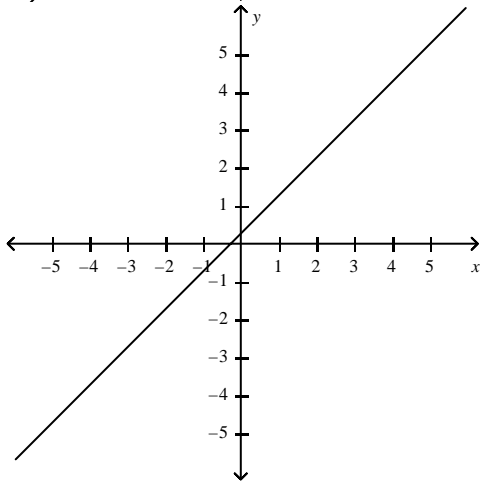
a.



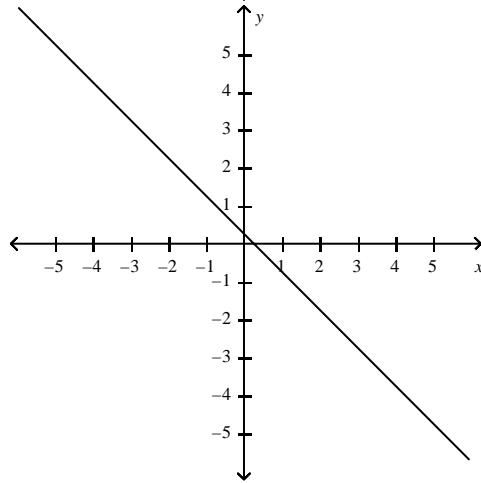
b.



c.



d.



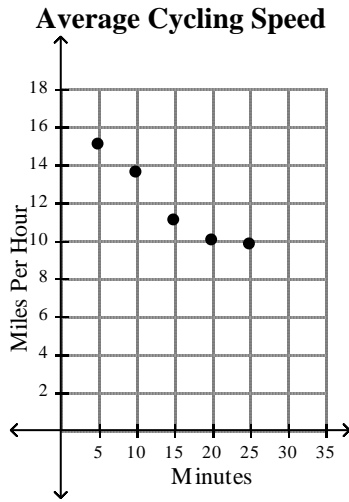
A bowl contains 7 green chips, 4 blue chips, and 9 red chips. You choose one chip at random. Find the probability.

20.  $P(\text{green or blue})$

- a.  $\frac{9}{20}$  b.  $\frac{11}{20}$  c. 1 d.  $\frac{11}{21}$

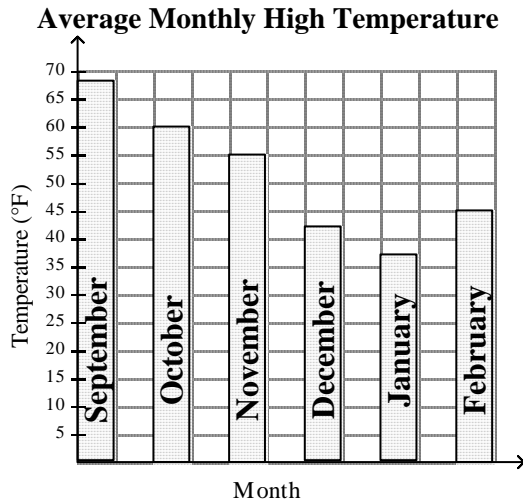
Determine whether the graph shows a positive correlation, a negative correlation, or no correlation. If there is a positive or negative correlation, describe its meaning in the situation.

21.



- a. no correlation   b. negative; as time passes, speed decreases   c. positive; as time passes, speed increases  
 d. positive; as time passes, speed decreases

The students in Mr. Johnson's science class recorded the average monthly high temperature for September through February. They used the data to draw the following bar graph.



22. How much warmer was the average high temperature in October than in February?  
 a. 25°   b. 15°   c. 5°   d. 30°

Find the quotient.

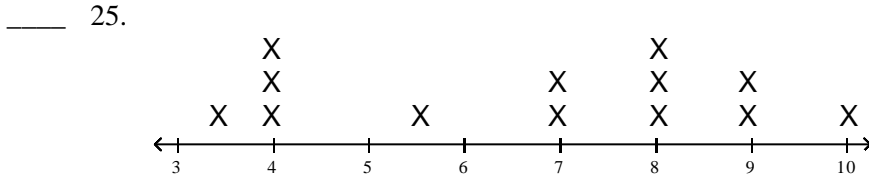
23.  $\frac{-120}{8}$

- a. -128   b. -17.142857   c. 15   d. -15

Write the point-slope form of an equation for a line that passes through the point with the given slope.

24.  $(-6, -6), m = -\frac{4}{7}$   
 a.  $y - 6 = -\frac{4}{7}(x + 6)$    b.  $y + 6 = -\frac{4}{7}(x - 6)$    c.  $y + 6 = \frac{4}{7}(x + 6)$    d.  $y + 6 = -\frac{4}{7}(x + 6)$

Find the mean, median, and mode for the data set. Round answers to the nearest tenth if necessary. Then tell which best represents the data.



- a. 6.7, 7, 8, mode   b. 7, 6.7, 4, mode   c. 6.7, 7, 4 and 8, median   d. 5.7, 7, none, mean

26.

| Stem | Leaf  |
|------|-------|
| 2    | 4 7 8 |
| 3    | 2 8   |

$2|4 = 24$

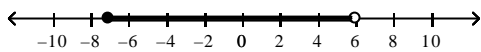
- a. 29.8, 28, none, mean or median   b. 28, 29.8, none, mode   c. 29.8, 28, 27, mode   d. 27, 28, none, mode

Translate the sentence into an equation.

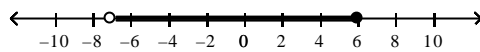
27. Nine less than the product of three and the number  $x$  is equal to one-half the sum of  $x$  and 12.  
 a.  $3x - 9 = \frac{1}{2}x + 12$    b.  $3(x - 9) = \frac{1}{2}x + 12$    c.  $\frac{3}{x} - 9 = \frac{1}{2}(x + 12)$    d.  $3x - 9 = \frac{1}{2}(x + 12)$

Solve the compound inequality and graph the solution set.

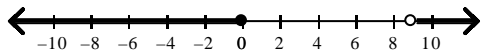
28.  $u + 8 \geq 1$  and  $u - 3 < 3$   
 a.  $-7 \leq u < 6$



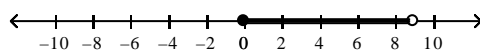
- c.  $-7 \leq u < 6$



- b.  $0 \leq u < 9$



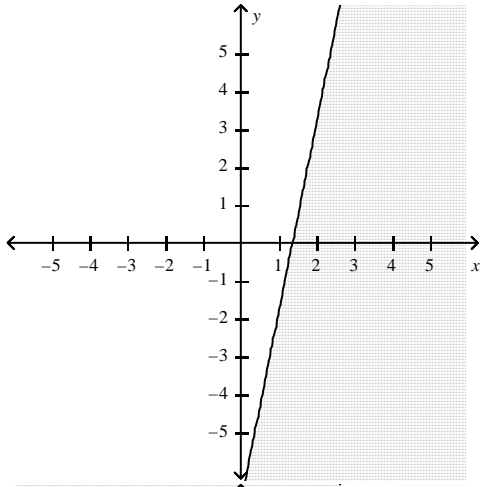
- d.  $0 \leq u < 9$



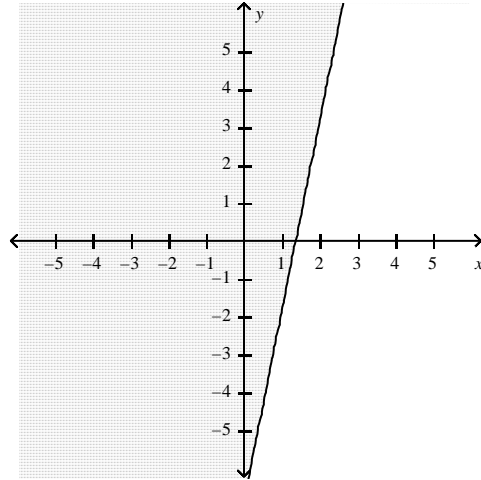
Graph the inequality.

29.  $y \leq 5x - 7$

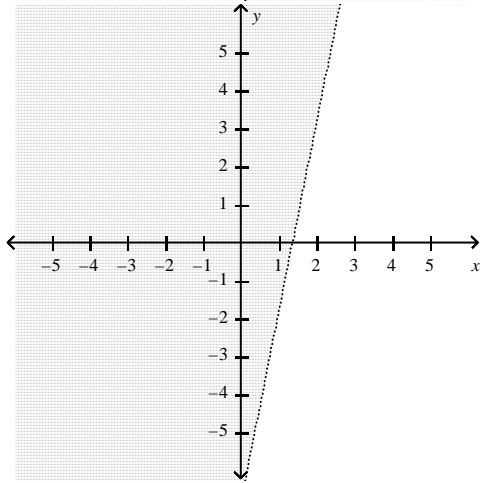
a.



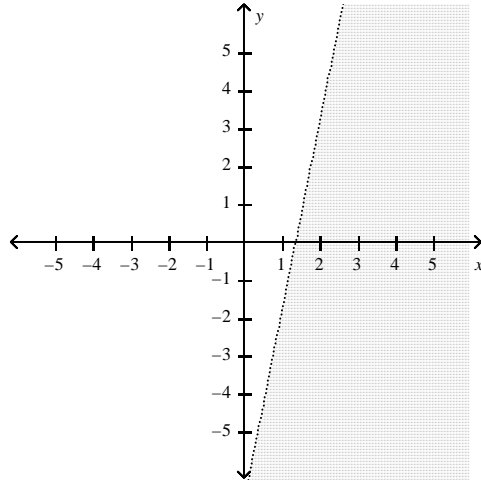
b.



c.



d.

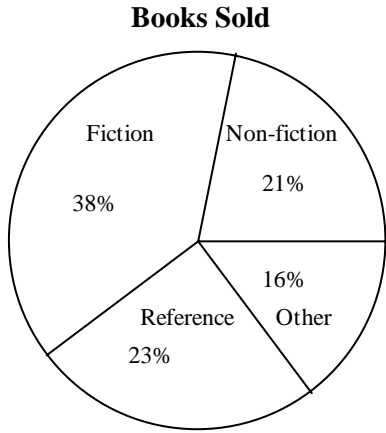


30. Write the set of numbers in order from least to greatest.

$\sqrt{15}, 7.9, \sqrt{7.9}$

- a.  $\sqrt{7.9}, \sqrt{15}, 7.9$    b.  $\sqrt{7.9}, 7.9, \sqrt{15}$    c.  $\sqrt{15}, \sqrt{7.9}, 7.9$    d.  $7.9, \sqrt{15}, \sqrt{7.9}$

31. The following circle graph shows the types of books people choose when shopping at a local bookstore. If the graph is misleading, tell why it is misleading.



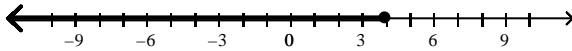
- a. The graph is not misleading. b. The percents do not have a sum of 100. c. You cannot have a category for Other. d. The sections need to be shaded.

*Factor the monomial completely.*

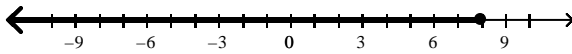
32.  $-110c^4d^2e^3$   
 a.  $-2 \cdot 5 \cdot 11 \cdot c \cdot c \cdot c \cdot c \cdot d \cdot d \cdot e \cdot e \cdot e$  b.  $-1 \cdot 2 \cdot 5 \cdot 11 \cdot c \cdot c \cdot c \cdot c \cdot d \cdot d \cdot e \cdot e \cdot e$   
 c.  $-1 \cdot 5 \cdot 22 \cdot c \cdot c \cdot c \cdot c \cdot d \cdot d \cdot e \cdot e \cdot e$  d.  $-1 \cdot 2 \cdot 5 \cdot 11 \cdot c \cdot c \cdot c \cdot d \cdot d \cdot e \cdot e \cdot e$

*Solve the inequality. Graph the solution on a number line.*

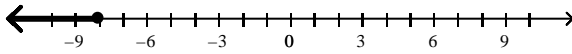
33.  $-2 \geq w - 6$   
 a.  $4 \geq w$



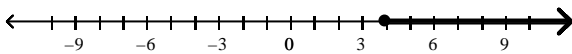
- b.  $8 \geq w$



- c.  $-8 \geq w$

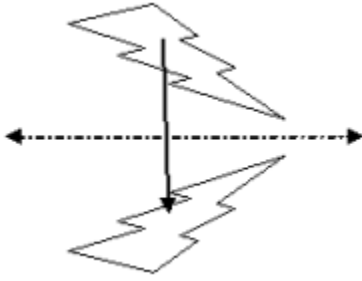


- d.  $4 \leq w$



Identify each transformation as a reflection, translation, dilation, or rotation.

\_\_\_ 34.



- a. translation   b. reflection   c. dilation   d. rotation

Find the next three terms in the sequence.

\_\_\_ 35. 6, 7, 9, 12, 16, ...  
a. 22, 28, 35   b. 21, 27, 34   c. 20, 26, 33   d. 22, 29, 36

\_\_\_ 36. 1, 4, 16, 64, ...  
a. 256, 1024, 4096   b. 68, 72, 76   c. 246, 984, 3936   d. 192, 576, 1728

Evaluate the expression.

\_\_\_ 37.  $54 - 3(8 - 4)$   
a. 204   b. 42   c. 26   d. 90

\_\_\_ 38.  $2 + 2(2)^2(5) + 8$   
a. 50   b. 106   c. 88   d. 90

Find the difference.

\_\_\_ 39.  $\frac{9}{10} - \frac{13}{14}$   
a.  $-1\frac{29}{35}$    b.  $5\frac{1}{2}$    c.  $\frac{1}{35}$    d.  $-\frac{117}{140}$

State whether the percent of change is a percent of increase or a percent of decrease. Then find the percent of change. Round to the nearest whole percent.

\_\_\_ 40. original: 30  
new: 10  
a. decrease; 200%   b. decrease; 67%   c. increase; 67%   d. increase; 200%

Factor the polynomial.

\_\_\_ 41.  $12g + 20h$   
a.  $4(3g + 5h)$    b.  $3(4g + 5h)$    c.  $4g(3 + 5h)$    d.  $5(3g + 4h)$

- \_\_\_ 42.  $12b^2 - 192$   
 a.  $(b+4)(b-4)$  b.  $(b+16)(b-16)$  c.  $12(b+4)(b-4)$  d.  $12(b+16)(b-16)$

*Solve the equation.*

- \_\_\_ 43.  $3(4x+4) = 2(5x+9) - 12$   
 a.  $-9$  b.  $-\frac{3}{11}$  c.  $-\frac{7}{2}$  d.  $-3$

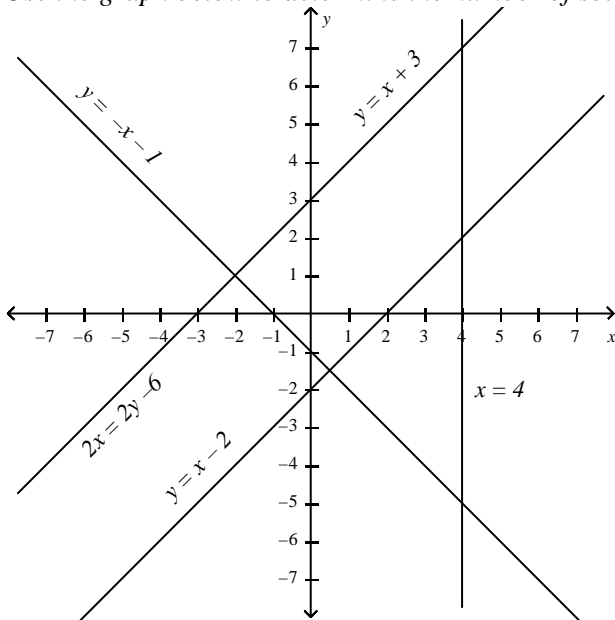
- \_\_\_ 44.  $m(m-3) - 2m(m-4) = -(m^2 - 4m) + 6$   
 a.  $-6$  b.  $\frac{13}{4}$  c.  $6$  d.  $\frac{1}{4}$

- \_\_\_ 45.  $(r-3)(r+6) = 0$   
 a.  $\{-3, 6\}$  b.  $\{0, 18\}$  c.  $\{3, -6\}$  d.  $\{-3\}$

*Solve the equation or formula for the variable specified.*

- \_\_\_ 46.  $df + 10h = 3$  for  $d$   
 a.  $d = \frac{3-10h}{f}$  b.  $d = 3 - 10h$  c.  $d = \frac{3+10h}{f}$  d.  $d = f(3-10h)$

*Use the graph below to determine the number of solutions the system has.*



- \_\_\_ 47.  $2x = 2y - 6$   
 $y = x - 2$   
 a. no solution b. one c. two d. infinitely many

Solve the proportion. If necessary, round to the nearest hundredth.

48.  $\frac{6}{7} = \frac{p}{42}$   
 a. 48 b. 30 c. 42 d. 36

Two trains leave Chicago at the same time, one traveling east and the other traveling west. The eastbound train travels at 50 miles per hour, and the westbound train travels at 40 miles per hour. Let  $t$  represent the amount of time since their departure.

|                 | $r$ | $t$ | $d = rt$ |
|-----------------|-----|-----|----------|
| Eastbound Train |     |     |          |
| Westbound Train |     |     |          |

49. Write an equation that could be used to determine when the trains will be 405 miles apart.  
 a.  $50t - 40t = 405$  b.  $50t + 40t = 405$  c.  $405 = 50t \times 40t$  d.  $50(t + 1) + 40t = 405$

50. Complete the table representing the situation.

a.

|                 | $r$ | $t$ | $d = rt$ |
|-----------------|-----|-----|----------|
| Eastbound Train | 50  | $t$ | $50t$    |
| Westbound Train | 40  | $t$ | $40t$    |

b.

|                 | $r$ | $t$ | $d = rt$ |
|-----------------|-----|-----|----------|
| Eastbound Train | 40  | $t$ | $40t$    |
| Westbound Train | 50  | $t$ | $50t$    |

c.

|                 | $r$ | $t$     | $d = rt$    |
|-----------------|-----|---------|-------------|
| Eastbound Train | 50  | $t + 1$ | $50(t + 1)$ |
| Westbound Train | 40  | $t$     | $40t$       |

d.

|                 | $r$ | $t$ | $d = rt$ |
|-----------------|-----|-----|----------|
| Eastbound Train | 50  | $t$ | $50t$    |
| Westbound Train | 50  | $t$ | $50t$    |

Translate the equation into a verbal sentence.

51.  $5(x - y) = 3y + 12$   
 a. Five times the difference of  $x$  and  $y$  is 12 more than the product of 3 and  $y$ . b. Five times the sum of  $x$  and  $y$  is 12 more than the product of 3 and  $y$ . c. Five times the difference of  $x$  and  $y$  is 12 more than the quotient of 3 and  $y$ . d. Five times  $x$  and  $y$  is 12 more than the product of 3 and  $y$ .
52.  $3y + 8 = 32$   
 a. Three times a number  $y$  minus 8 equals 32. b. Three times a number  $y$  plus 8 equals 32. c. Three times a number  $y$  times 8 equals 32. d. Three times a number  $y$  divided by 8 equals 32.

Find a counterexample for the statement.

53. If you finish in the top 10% in medical school, then you will become a heart surgeon.  
 a. top 8% -- heart surgeon b. top 8% -- pediatrician c. top 12% -- general practice d. top 15% -- brain surgeon

Simplify the expression. If not possible, write simplified.

54.  $2(11d - 5)$   
 a. simplified b.  $22d - 10$  c.  $22d - 10d$  d.  $22d - 5$

Find the solution set for the equation, given the replacement set.

- \_\_\_\_\_ 55.  $y = 7x + 6$ ;  $\{(5, 41), (6, 44), (4, 39), (7, 42)\}$   
a.  $\{(7, 42)\}$  b.  $\{(4, 39)\}$  c.  $\{(6, 44)\}$  d.  $\{(5, 41)\}$

Solve the problem by working backward.

- \_\_\_\_\_ 56. A number is multiplied by 7, and then 14 is subtracted from the product. The result is 42. Find the number.  
a. 4 b. 7 c. 49 d. 8

Write an equation of the line with the given slope and y-intercept

- \_\_\_\_\_ 57. slope: 0.8, y-intercept: 10  
a.  $y = -0.8x + 10$  b.  $y = 0.8x - 10$  c.  $y = 0.8x + 10$  d.  $y = \frac{5}{7}x + 10$

- \_\_\_\_\_ 58. Find the absolute value.

$$\left| -\frac{17}{29} \right|$$

- a.  $\frac{17}{29}$  b. 0 c.  $\frac{29}{17}$  d.  $-\frac{17}{29}$

Find the final price of the item.

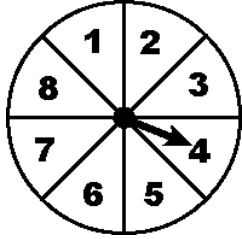
- \_\_\_\_\_ 59. shirt: \$28  
discount: 10%  
tax: 6.5%  
a. \$26.84 b. \$25.20 c. \$29.82 d. \$23.56

Mr. Collins is constructing a fence around his property. He already has 25 sections up and plans to add 8 sections each Saturday until he is finished.

- \_\_\_\_\_ 60. Find the total number of fence sections standing after 15 Saturdays.  
a. 383 sections b. 125 sections c. 145 sections d. 105 sections

Find the next three terms of the arithmetic sequence.

- \_\_\_\_\_ 61. 55, 47, 39, 31, . . .  
a. 36, 41, 46 b. 23, 15, 7 c. 29, 27, 25 d. 26, 21, 16



Find the odds of the outcome if the spinner is spun once.

- \_\_\_ 62. a multiple of 4  
 a. 1:3 b. 3:5 c.  $\frac{1}{4}$  d. 3:1

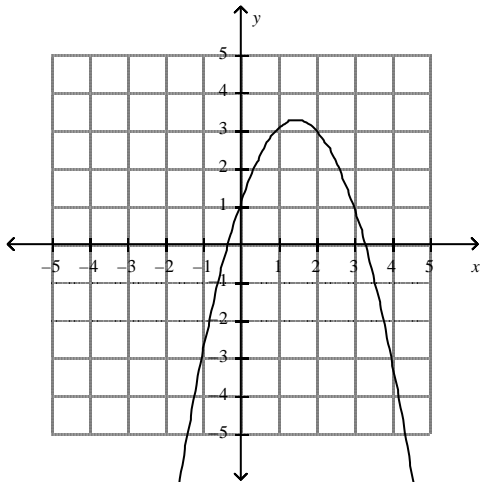
Find the odds of the outcome if a computer randomly chooses a number from 1 to 30.

- \_\_\_ 63. a number less than 13  
 a. 12:19 b. 11:19 c. 2:3 d. 2:5

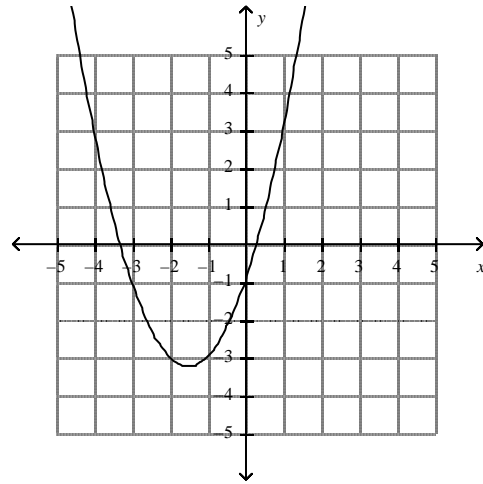
Graph the function.

\_\_\_ 64.  $y = x^2 + 3x + 1$

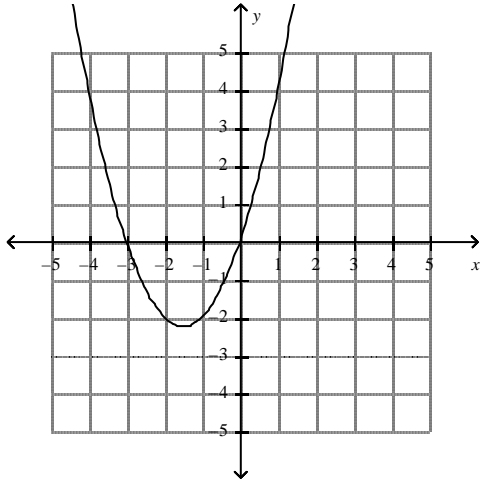
a.



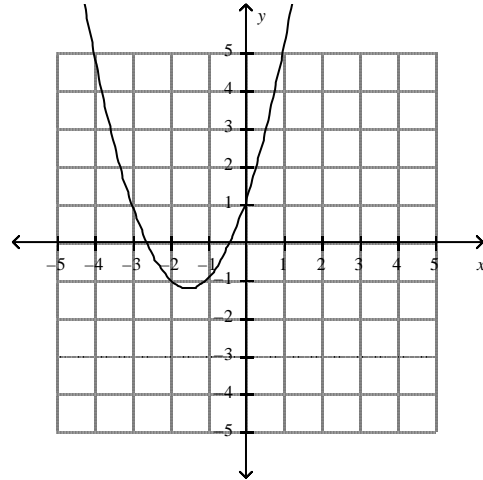
b.



c.



d.

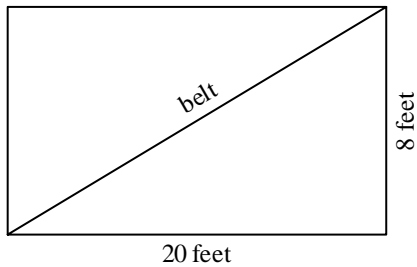


Simplify. Assume that no denominator is equal to zero.

\_\_\_ 65.  $\frac{36m^{-4}n^6}{4mn^{-2}p^{-4}}$

a.  $\frac{9n^4p^4}{m^3}$  b.  $\frac{9n^8}{m^5p^4}$  c.  $\frac{9n^8p^4}{m^5}$  d.  $\frac{9m^5}{n^8p^4}$

- \_\_\_ 66. A conveyor belt runs between floors of a building as pictured below. Find the slope of the belt as a positive number.



a. undefined b.  $\frac{5}{2}$  c.  $\frac{2}{5}$  d. 0

Find the degree of the polynomial.

\_\_\_ 67.  $10a^5b^4$

a. 20 b. 10 c. 9 d. 5

Use elimination to solve the system of equations.

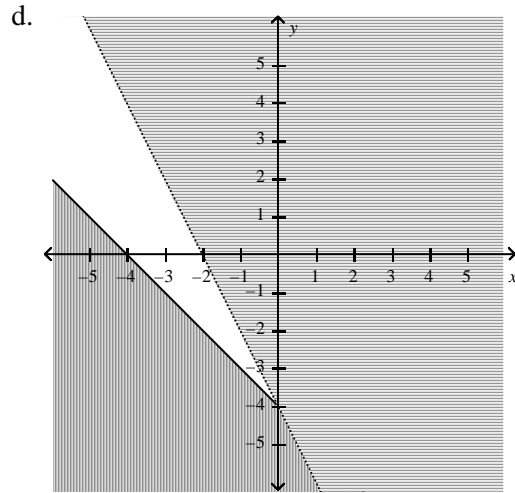
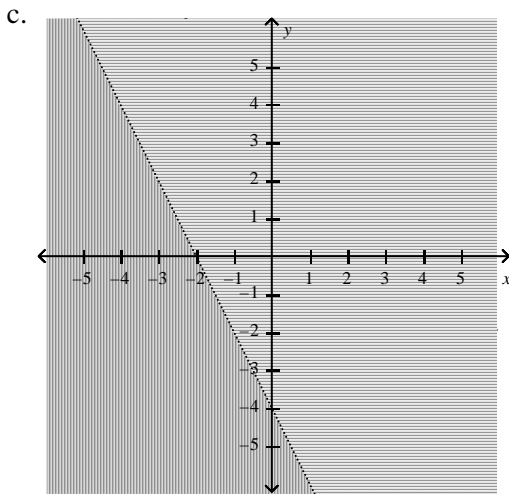
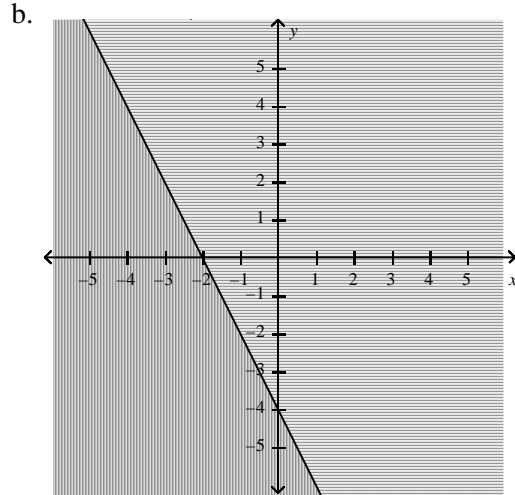
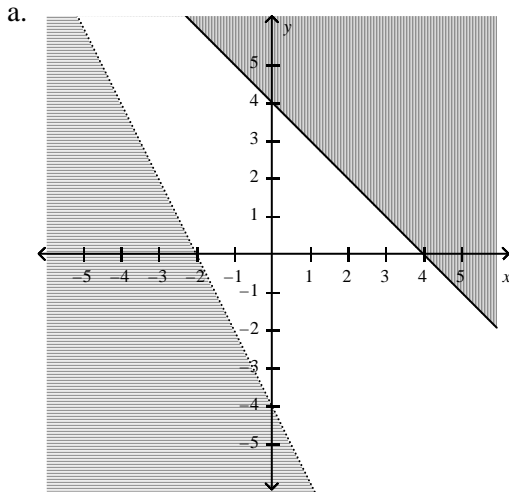
\_\_\_ 68.  $-2x + 7y = 6$

$2x + 10y = -6$

a. (-3, 0) b. (17, -4) c. (-17, 4) d. (3, 0)

Solve the system of inequalities by graphing.

69.  $y \leq -x + 4$   
 $y > -2x - 4$

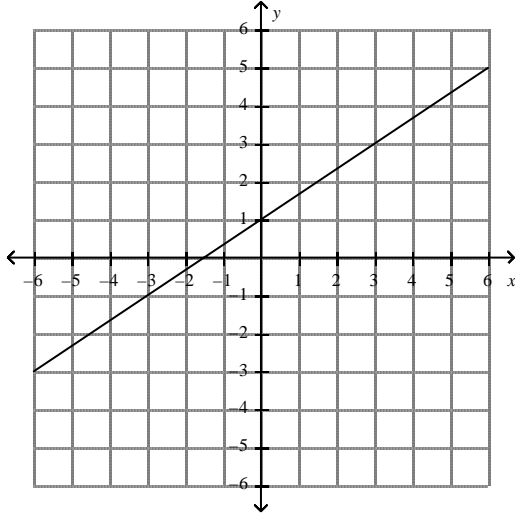


Use substitution to solve the system of equations.

70.  $y = x + 3$   
 $8x - 7y = 12$   
 a. (36, 33) b. (-9, -6) c. (12, 15) d. (33, 36)

Write an equation in function notation for the relation.

71.



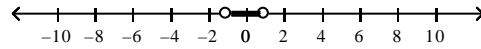
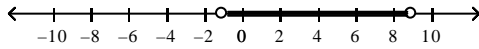
- a.  $f(x) = x + 1$    b.  $f(x) = \frac{2}{3}x + 2$    c.  $f(x) = \frac{2}{3}x + 1$    d.  $f(x) = -\frac{2}{3}x - 1$

Solve the open sentence and graph the solution.

72.  $|z - 4| < 5$

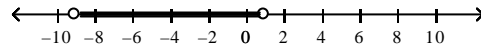
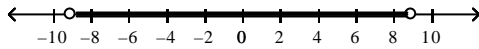
a.  $-1 < z < 9$

c.  $-1 < z < 1$



b.  $-9 < z < 9$

d.  $-9 < z < 1$



Write an equation of the line that passes through each point with the given slope.

73.  $(-3, -4), m = 3$

- a.  $y = 3x + 13$    b.  $y = 3x - 5$    c.  $y = -3x + 5$    d.  $y = 3x + 5$

74. Solve the equation.

$$a = \frac{6(14 - 8)}{2(8) + 2} + 10$$

- a. 20   b. 12   c. 14   d. 2

Factor the trinomial.

75.  $g^2 - 9g - 22$

- a.  $(x - 2)(x + 11)$    b.  $(x + 4)(x - 13)$    c.  $(x - 23)(x + 1)$    d.  $(x + 2)(x - 11)$

## GEOMETRY-Pre-Course Test Packet

### Answer Section

#### MULTIPLE CHOICE

1. ANS: A

Use the two points to calculate the slope of the line. Then find the slope intercept form of the equation of the line using the slope and one of the points.

DIF: Average OBJ: 5-7.2 Write equations for lines of fit.

STO: MI III.1.1, MI III.1.2, MI III.1.3, MI III.1.4, MI III.2.1 TOP: Write equations for lines of fit

KEY: Best Fit Line, Equations MSC: 1998 Lesson 6-3

NOT: /A/ Correct! /B/ Which variable is the independent variable? /C/ Is the slope of the line of fit positive?

/D/ How did you determine the slope of the line?

2. ANS: B

Use the two points to calculate the slope of the line. Then find the slope intercept form of the equation of the line using the slope and one of the points. Use the equation to make the prediction.

DIF: Average OBJ: 5-7.2 Write equations for lines of fit.

STO: MI III.1.1, MI III.1.2, MI III.1.3, MI III.1.4, MI III.2.1 TOP: Write equations for lines of fit

KEY: Best Fit Line, Equations MSC: 1998 Lesson 6-3

NOT: /A/ What is the slope in your equation? /B/ Correct! /C/ Do you expect the number quarts to increase?

/D/ Did you evaluate the equation carefully?

3. ANS: A

Replace the variable with each member of the replacement set. All values from the replacement set that make the inequality true are solutions.

DIF: Basic OBJ: 1-3.2 Solve open sentence inequalities.

STO: MI V.2.2, MI VI.2.2 TOP: Solve open sentence inequalities

KEY: Inequalities, Solve Inequalities MSC: 1998 Lesson 1-5

NOT: /A/ Correct! /B/ Check all replacements again. /C/ Do you have all the solutions in the replacement

set? /D/ Do you have too many solutions?

4. ANS: A

Subtract the variable term on the left from both sides. Divide both sides by the coefficient of the variable. Remember to flip the inequality sign when dividing by a negative number.

DIF: Average OBJ: 6-3.3 Solve linear inequalities with decimals involving more than one operation.

STO: MI I.2.6, MI V.2.2, MI V.2.3, MI VI.2.2

TOP: Solve linear inequalities with decimals involving more than one operation

KEY: Linear Inequalities, Decimals MSC: 1998 Lesson 7-3

NOT: /A/ Correct! /B/ Did you divide both sides by the coefficient of the variable? /C/ Are you sure that your decimal point is in the right place? /D/ Did you subtract the variable term on the left from both sides?

5. ANS: A

Using the Distributive Property, multiply to eliminate the parentheses. Combine like terms and then solve the inequality for  $j$ .

DIF: Average

OBJ: 6-3.5 Solve linear inequalities with decimals involving the Distributive Property.

STO: MI I.2.6, MI V.2.2, MI V.2.3, MI VI.2.2

TOP: Solve linear inequalities with decimals involving the Distributive Property

KEY: Linear Inequalities, Decimals, Distributive Property MSC: 1998 Lesson 7-3

NOT: /A/ Correct! /B/ Double-check your calculations. Remember that a negative sign in front of parentheses means to multiply by -1./C/ Double-check your calculations. The empty set means that the inequality resulted in a false statement. /D/ Double-check your calculations. Remember that a negative sign in front of parentheses means to multiply by -1.

6. ANS: D

Divide both sides of the inequality by the constant on the left. Remember to flip the inequality sign since you are dividing by a negative number.

DIF: Average OBJ: 6-2.2 Solve linear inequalities by using division.

STO: MI I.2.6, MI V.2.2, MI V.2.3 TOP: Solve linear inequalities by using division

KEY: Linear Inequalities, Division MSC: 1998 Lesson 7-2

NOT: /A/ Use division instead of subtraction to solve this./B/ Use division instead of multiplication to solve this. /C/ Remember to flip the inequality sign since you are dividing by a negative number. /D/ Correct!

7. ANS: C

First combine the two variable terms on the left. Secondly, combine the constants by subtracting the constant term on the left from both sides. Next, divide both sides by the coefficient of the variable. Remember to flip the inequality sign since you are dividing by a negative number.

DIF: Average OBJ: 6-3.1 Solve linear inequalities with integers involving more than one operation.

STO: MI I.2.6, MI V.2.2, MI V.2.3

TOP: Solve linear inequalities with integers involving more than one operation

KEY: Linear Inequalities, Integers MSC: 1998 Lesson 7-3

NOT: /A/ You added instead of subtracting the constant on the left from both sides. /B/ You must combine the two variable terms before dividing./C/ Correct! /D/ You forgot to flip the inequality sign since you are dividing by a negative number.

8. ANS: D

Multiply both sides of the inequality by the reciprocal of the fraction on the left. Remember to flip the inequality sign since you will be multiplying by a negative number.

DIF: Basic OBJ: 6-2.1 Solve linear inequalities by using multiplication.

STO: MI I.2.6, MI V.2.2, MI V.2.3 TOP: Solve linear inequalities by using multiplication

KEY: Linear Inequalities, Multiplication MSC: 1998 Lesson 7-2

NOT: /A/ You multiplied both sides of the inequality by the denominator of the fraction on the left. Now you need to divide both sides by the numerator. /B/ Your answer is the reciprocal of the fraction on the left. You need to multiply both sides of the inequality by this number./C/ Did you remember to flip the inequality sign when multiplying by a negative number? /D/ Correct!

9. ANS: A

Since the product of any number and 1 is equal to the number, 1 is called the multiplicative identity.

The reflexive property says that any quantity is equal to itself.

The sum of any number and 0 is equal to the number. Thus, 0 is called the additive identity.

DIF: Basic OBJ: 1-4.1 Recognize the properties of identity and equality.

STO: MI V.2.2, MI VI.2.2 TOP: Recognize the properties of identity and equality

KEY: Identity Property, Equality Property MSC: 1998 Lesson 1-6

NOT: /A/ Correct! /B/ Are you sure about the value of  $n$ ? /C/ Are you sure about the property? /D/ Are you sure about the property?

10. ANS: A

To solve an equation means to find all the values of the variable that make the equation a true statement. One way to do this is to isolate the variable on one side of the equation. You can sometimes do this by subtracting the same number from both sides of the equation.

DIF: Basic                    OBJ: 3-2.6 Solve equations with decimals by using subtraction.

STO: MI V.1.3            TOP: Solve equations with decimals by using subtraction

KEY: Solve Equations, Subtraction, Decimals                    MSC: 1998 Lesson 3-1

NOT: /A/ Correct! /B/ Did you subtract the same number from both sides? /C/ Did you subtract from both sides? /D/ Be careful with sign rules.

11. ANS: A

If an equation is true and each side is multiplied or divided by the same number, the resulting equation is true.

DIF: Average                OBJ: 3-3.5 Solve equations with decimals by using multiplication and division.

STO: MI V.1.3            TOP: Solve equations with decimals by using multiplication and division

KEY: Solve Equations, Multiplication, Division, Decimals                    MSC: 1998 Lesson 3-2

NOT: /A/ Correct! /B/ Be careful with sign rules. /C/ How do you undo multiplication? /D/ Did you add a number to both sides?

12. ANS: A

To solve an equation means to find all the values of the variable that make the equation a true statement. One way to do this is to isolate the variable on one side of the equation. You can sometimes do this by adding the same number to both sides of the equation.

DIF: Average                OBJ: 3-2.2 Solve equations with fractions by using addition.

STO: MI V.1.3            TOP: Solve equations with fractions by using addition

KEY: Solve Equations, Addition, Fractions                    MSC: 1998 Lesson 3-1

NOT: /A/ Correct! /B/ What did you add to both sides? /C/ How do you add fractions? /D/ Be careful with sign rules.

13. ANS: A

To solve an equation with more than one operation, undo operations by working backward.

DIF: Average                OBJ: 3-4.2 Solve equations involving more than one operation.

STO: MI I.1.3, MI I.1.4, MI I.1.5, MI V.2.2

TOP: Solve equations involving more than one operation                    KEY: Solve Equations, Equations

MSC: 1998 Lesson 3-3

NOT: /A/ Correct! /B/ How did you undo the operation in the first step? /C/ What operation did you try to undo first? /D/ Be careful with sign rules.

14. ANS: B

To add rational numbers with the same sign, add their absolute values. The sum has the same sign as the addends.

To add rational numbers with different signs, subtract the lesser absolute value from the greater absolute value. The sum has the same sign as the number with the greater absolute value.

DIF: Average                OBJ: 2-2.3 Add decimals.

STO: MI IV.1.1, MI IV.1.4, MI IV.2.5, MI IV.3.1, MI V.1.3                    TOP: Add decimals

KEY: Decimals, Addition                    MSC: 1998 Lesson 2-1, 1998 Lesson 2-3, 1998 Lesson 2-5

NOT: /A/ How do you determine the sign of a sum? /B/ Correct! /C/ How do you know when to add or subtract absolute values in addition of rational numbers? /D/ Did you follow the rules for addition of rational numbers?

15. ANS: A

Find the product using the square of a sum and a difference.

$$36c^2 - 81$$

DIF: Average      OBJ: 8-8.3 Find the squares of a sum and a difference.

TOP: Find the squares of a sum and a difference

KEY: Multiply Binomials, Squares of Sum and Difference      MSC: 1998 Lesson 9-8

NOT: /A/ Correct! /B/  $(a + b)(a - b) = a$  squared  $- b$  squared. /C/ Don't add, multiply. /D/ Watch your signs.

16. ANS: D

The product of two numbers having the same sign is positive.

The product of two numbers having different signs is negative.

DIF: Average      OBJ: 2-3.1 Multiply integers.

STO: MI IV.1.1, MI IV.1.4, MI IV.2.5, MI IV.3.1, MI V.1.3      TOP: Multiply integers

KEY: Integers, Multiplication      MSC: 1998 Lesson 2-6

NOT: /A/ Did you add the numbers?/B/ How do you determine the sign of a product? /C/ Did you subtract?  
/D/ Correct!

17. ANS: C

The product of two numbers having the same sign is positive.

The product of two numbers having different signs is negative.

DIF: Average      OBJ: 2-3.3 Multiply decimals.

STO: MI IV.1.1, MI IV.1.4, MI IV.2.5, MI IV.3.1      TOP: Multiply decimals

KEY: Decimals, Multiplication      MSC: 1998 Lesson 2-6

NOT: /A/ Did you subtract the two numbers? /B/ How do you determine the sign of a product?/C/ Correct!  
/D/ Did you add the two numbers?

18. ANS: A

Find the product using the square of a difference pattern.

$$16r^2 - 2(36)r + 81$$

$$16r^2 - 72r + 81$$

DIF: Average      OBJ: 8-8.2 Find the squares of differences.

TOP: Find the squares of differences      KEY: Multiply Binomials, Squares of Differences

MSC: 1998 Lesson 9-8

NOT: /A/ Correct! /B/  $(a - b)$  squared =  $a$  squared  $- 2ab + b$  squared. /C/ Watch your signs./D/  $(a - b)$   
squared =  $a$  squared  $- 2ab + b$  squared.

19. ANS: C

The graph of a linear equation is a line. The line represents all the solutions of the linear equation. Also, every ordered pair on the line satisfies the equation.

DIF: Average      OBJ: 4-5.2 Graph linear equations.      STO: MI I.1.2, MI V.2.1, MI V.2.2

TOP: Graph linear equations      KEY: Graph Equations, Linear Equations

MSC: 1998 Lesson 5-4

NOT: /A/ How did you graph the line? /B/ Are solutions to the equation on the line?/C/ Correct! /D/ Are all  
points on the line solutions to the equation?

20. ANS: B

The probability of an event is a ratio of the number of favorable outcomes to the number of possible outcomes.

DIF: Average      OBJ: 2-6.1 Find the probability of a simple event.

STO: MI I.1.3, MI I.1.5, MI III.1.4, MI III.2.3, MI III.2.4

TOP: Find the probability of a simple event

KEY: Probability, Simple Events

MSC: 1998 Lesson 4-6

NOT: /A/ How many favorable events are there? /B/ Correct! /C/ Will you always choose blue or green? /D/ How many possible outcomes are there?

21. ANS: B

A scatter plot is a graph in which two sets of data are plotted as ordered pairs in a coordinate plane. There is a positive correlation when as  $x$  increases,  $y$  increases. There is a negative correlation when as  $x$  increases,  $y$  decreases. There is no correlation when  $x$  and  $y$  are not related.

DIF: Average OBJ: 5-7.1 Interpret points on a scatter plot.

TOP: Interpret points on a scatter plot KEY: Scatter Plot, Interpret Data

MSC: 1998 Lesson 6-3

NOT: /A/ Are the variables related? /B/ Correct! /C/ Is the speed increasing? /D/ What is meant by positive correlation?

22. ANS: B

Subtract the temperature indicated by the February bar from that indicated by the October bar.

DIF: Average OBJ: 1-9.1 Analyze data given in tables and graphs (bar, line, and circle).

STO: MI I.1.2, MI I.1.4, MI I.2.2, MI V.1.1, MI V.2.4

TOP: Analyze data given in tables and graphs (bar, line, and circle)

KEY: Graphs, Tables

NOT: /A/ Did you subtract carefully? /B/ Correct! /C/ Did you compare the correct 2 months? /D/ Did you subtract carefully?

23. ANS: D

The quotient of two numbers having the same sign is positive.

The quotient of two numbers having different signs is negative.

DIF: Average OBJ: 2-4.1 Divide integers.

STO: MI IV.1.1, MI IV.1.4, MI IV.2.5, MI IV.3.1

TOP: Divide integers

KEY: Integers, Division

MSC: 1998 Lesson 2-7, 1998 Lesson 3-7

NOT: /A/ Did you subtract the two numbers. /B/ Did you divide by the correct number? /C/ How do you determine the sign of a quotient? /D/ Correct!

24. ANS: D

The linear equation  $y - y_1 = m(x - x_1)$  is written in point-slope form, where  $(x_1, y_1)$  is a given point on a nonvertical line and  $m$  is the slope of the line.

DIF: Average OBJ: 5-5.1 Write the equation of a line in point-slope form.

STO: MI I.2.2, MI I.2.5, MI I.2.6, MI III.1.1, MI III.3.4

TOP: Write the equation of a line in point-slope form

KEY: Point-Slope Form, Equations, Lines

MSC: 1998 Lesson 6-2

NOT: /A/ What is the y-coordinate of the given point? /B/ Did you subtract the x-coordinate from x? /C/ What is the slope of the line? /D/ Correct!

25. ANS: C

The mean is the sum of the data values divided by the number of values in the data set.

The median is the middle number in a data set when the numbers are arranged in numerical order. If there is an even number of values, the median is the mean of the two middle values. The mode is the number or numbers that occur most often in the set of data.

DIF: Average OBJ: 2-5.3 Analyze data using mean, median, and mode.

STO: MI I.1.2, MI III.1.1, MI III.1.3, MI III.2.1, MI III.2.3

TOP: Analyze data using mean, median, and mode

KEY: Mean, Median, Mode, Analyze Data

MSC: 1998 Lesson 2-2, 1998 Lesson 3-7

NOT: /A/ Is 8 the only mode? /B/ Which one is the mean? /C/ Correct! /D/ Did you find the mean correctly? Is there no mode?

26. ANS: A

The mean is the sum of the data values divided by the number of values in the data set.

The median is the middle number in a data set when the numbers are arranged in numerical order. If there is an even number of values, the median is the mean of the two middle values. The mode is the number or numbers that occur most often in the set of data.

DIF: Average OBJ: 2-5.3 Analyze data using mean, median, and mode.

STO: MI I.1.2, MI III.1.1, MI III.1.3, MI III.2.1, MI III.2.3

TOP: Analyze data using mean, median, and mode

KEY: Mean, Median, Mode, Analyze Data

MSC: 1998 Lesson 2-2, 1998 Lesson 3-7

NOT: /A/ Correct! /B/ Did you find the mean and median correctly? /C/ What is the mode? /D/ Did you find the mean correctly?

27. ANS: D

Translate verbal sentences into equations by using key words and phrases you have learned to replace words with symbols.

DIF: Average OBJ: 3-1.1 Translate verbal sentences into equations.

TOP: Translate verbal sentences into equations

KEY: Verbal Sentences, Equations

MSC: 1998 Lesson 2-9

NOT: /A/ Do you need parentheses in the equation? /B/ Are the parentheses in the right place? /C/ Does product mean division? /D/ Correct!

28. ANS: A

Solve each of the inequalities for  $u$ . Combine the two resulting inequalities into one sentence and graph it on the number line. Be careful to include the endpoint on the left but not the value on the right.

DIF: Basic

OBJ: 6-4.1 Solve compound inequalities containing the word "and" and graph their solution sets.

STO: MI I.2.6, MI V.2.2, MI V.2.3, MI VI.2.2

TOP: Solve compound inequalities containing the word "and" and graph their solution sets

KEY: Compound Inequalities, Graphs, Solution Set

MSC: 1998 Lesson 7-4

NOT: /A/ Correct! /B/ Double-check your calculations and your graph./C/ Remember that an open circle on a graph means the endpoint is not included and a solid circle means it is included. /D/ Did you use subtraction to solve the first equation and addition to solve the second?

29. ANS: A

Graph the inequality as if it were an equation. Since the points on the line are included in the solution, use a solid line. Choose a point in one of the half-planes and test it. If the point satisfies the inequality, then shade that half-plane. If the point does not satisfy the inequality, shade the other half-plane.

DIF: Basic OBJ: 6-6.1 Graph inequalities on the coordinate plane.

STO: MI V.2.2, MI V.2.3

TOP: Graph inequalities on the coordinate plane

KEY: Inequalities, Graphs, Coordinate Plane

MSC: 1998 Lesson 7-8

NOT: /A/ Correct! /B/ Did you test a point to determine which half-plane to shade? /C/ Did you test a point to determine which half-plane to shade? Are the points on the line itself included in the solution? This determines whether the line is solid or dashed./D/ Are the points on the line itself included in the solution? This determines whether the line is solid or dashed.

30. ANS: A

To write a set of real numbers in order from least to greatest, find a decimal approximation for each number in the set and compare.

DIF: Average      OBJ: 2-7.4 Order real numbers.

STO: MI IV.1.1, MI IV.2.1, MI IV.2.2, MI IV.2.5, MI IV.3.1      TOP: Order real numbers

KEY: Real Numbers, Order Numbers      MSC: 1998 Lesson 2-8

NOT: /A/ Correct! /B/ Did you convert the numbers to decimals for comparison? /C/ Did you use rational approximations? /D/ Did you order the numbers from least to greatest?

31. ANS: B

One way that a graph can be misleading is that the percents on a circle graph do not have a sum of 100.

DIF: Average      OBJ: 1-9.2 Determine whether graphs are misleading.

STO: MI I.1.2, MI I.1.3, MI III.1.3, MI III.1.4, MI III.2.1

TOP: Determine whether graphs are misleading

KEY: Graphs, Misleading Graphs

NOT: /A/ What can make a circle graph misleading? /B/ Correct! /C/ Can Other be a category? /D/ Does that affect the accuracy of the graph?

32. ANS: B

The prime factors of 110 are  $-1 \cdot 2 \cdot 5 \cdot 11$ .

The prime factors of  $c^4$  are  $c \cdot c \cdot c \cdot c$ .

The prime factors of  $d^2$  are  $d \cdot d$ .

The prime factors of  $e^3$  are  $e \cdot e \cdot e$ .

Thus,  $-110c^4d^2e^3$  is factored into  $-1 \cdot 2 \cdot 5 \cdot 11 \cdot c \cdot c \cdot c \cdot c \cdot d \cdot d \cdot e \cdot e \cdot e$ .

DIF: Average      OBJ: 9-1.2 Find prime factorizations of monomials.

STO: MI IV.3.3      TOP: Find prime factorizations of monomials

KEY: Prime Factorization, Monomials      MSC: 1998 Lesson 10-1

NOT: /A/ A negative number is factored completely when it is expressed as the product of  $-1$  and prime numbers. /B/ Correct! /C/ You want the prime factors. /D/ How many c's are there?

33. ANS: A

Solve the inequality by adding the constant on the right to both sides of the inequality.

DIF: Average      OBJ: 6-1.1 Solve linear inequalities by using addition.

TOP: Solve linear inequalities by using addition

KEY: Linear Inequalities, Addition

MSC: 1998 Lesson 7-1

NOT: /A/ Correct! /B/ Add to solve this inequality. /C/ Add to solve this inequality. /D/ Check the inequality sign.

34. ANS: B

A reflection is a figure flipped over a line.

A translation is a figure slid in any direction.

A dilation is a figure enlarged or reduced.

A rotation is a figure turned around a point.

DIF: Average

OBJ: 4-2.1 Transform figures by using reflections, translations, dilations, and rotations.

STO: MI I.1.5, MI II.2.1, MI II.2.2, MI II.2.5, MI V.2.2

TOP: Transform figures by using reflections, translations, dilations, and rotations

KEY: Reflections, Translations, Dilations, Rotations

NOT: /A/ Study the definitions for each type of transformation again. /B/ Correct! /C/ Does the figure match the definition of that transformation? /D/ Study the definition for each type of transformation carefully.

35. ANS: B  
When you make a conclusion based on a pattern of examples, you are using inductive reasoning. You can use inductive reasoning to find the next term in a sequence.

DIF: Average      OBJ: 4-8.1 Look for a pattern.  
STO: MI I.1.1, MI I.1.4, MI I.1.5, MI V.2.1      TOP: Look for a pattern  
KEY: Patterns, Sequences      MSC: 1998 Lesson 1-2, 1998 Lesson 5-6  
NOT: /A/ What is the pattern? /B/ Correct! /C/ Did you add correctly to get each term? /D/ What is the pattern?

36. ANS: A  
When you make a conclusion based on a pattern of examples, you are using inductive reasoning. You can use inductive reasoning to find the next term in a sequence.

DIF: Basic      OBJ: 4-8.1 Look for a pattern.  
STO: MI I.1.1, MI I.1.4, MI I.1.5, MI V.2.1      TOP: Look for a pattern  
KEY: Patterns, Sequences      MSC: 1998 Lesson 1-2, 1998 Lesson 5-6  
NOT: /A/ Correct! /B/ Does the pattern involve addition? /C/ Did you multiply carefully? /D/ Is that consistent with the pattern?

37. ANS: B  
Perform any operations within grouping symbols first. Then do all powers followed by multiplication and division from left to right, then addition and subtraction from left to right.

DIF: Average      OBJ: 1-2.1 Evaluate numerical expressions by using the order of operations.  
TOP: Evaluate numerical expressions by using the order of operations  
KEY: Evaluate Expressions, Order of Operations      MSC: 1998 Lesson 1-3  
NOT: /A/ Did you do multiplication before any addition or subtraction? /B/ Correct! /C/ Did you perform operations within parentheses first? /D/ Be careful with addition and subtraction.

38. ANS: A  
Perform any operations within grouping symbols first. Then do all powers followed by multiplication and division from left to right, then addition and subtraction from left to right.

DIF: Average      OBJ: 1-2.1 Evaluate numerical expressions by using the order of operations.  
TOP: Evaluate numerical expressions by using the order of operations  
KEY: Evaluate Expressions, Order of Operations      MSC: 1998 Lesson 1-3  
NOT: /A/ Correct! /B/ Did you addition before multiplication? /C/ Did you do addition before multiplication? /D/ Be careful with the order of operations.

39. ANS: A  
To subtract a rational number, add its additive inverse.

DIF: Average      OBJ: 2-2.5 Subtract fractions.  
STO: MI IV.1.1, MI IV.1.4, MI IV.2.5, MI IV.3.1, MI V.1.3      TOP: Subtract fractions  
KEY: Fractions, Subtraction MSC: 1998 Lesson 2-1, 1998 Lesson 2-3, 1998 Lesson 2-5  
NOT: /A/ Correct! /B/ Did you get a common denominator? /C/ Did you add? /D/ Did you multiply?

40. ANS: B  
First find the amount of change. Then find the percent of change by using the original number as the base.

DIF: Basic      OBJ: 3-7.1 Find percents of increase and decrease.  
STO: MI IV.3.2      TOP: Find percents of increase and decrease  
KEY: Percent of Increase, Percent of Decrease      MSC: 1998 Lesson 4-5  
NOT: /A/ Did you use the original number as the base? /B/ Correct! /C/ Which is the greater number, the

new or the original? /D/ Which number is greater?

41. ANS: A

The factors of  $12g$  are  $2 \cdot 2 \cdot 3 \cdot g$ .

The factors of  $20h$  are  $2 \cdot 2 \cdot 5 \cdot h$ .

The GCF of  $12g + 20h$  is 4.

Writing each term as the product of the GCF and its remaining factors gives  $4(3g) + 4(5h)$ .

Use the Distributive Property to factor out the GCF:  $4(3g + 5h)$ .

DIF: Basic                    OBJ: 9-2.1 Factor polynomials by using the Distributive Property.

STO: MI IV.3.3            TOP: Factor polynomials by using the Distributive Property

KEY: Factor Polynomials, Distributive Property

MSC: 1998 Lesson 10-2, 1998 Lesson 10-6

NOT: /A/ Correct! /B/ Check your factors again. /C/ Is  $g$  a factor of the second monomial? /D/ Check your factors again.

42. ANS: C

Factor 12 from both monomials.

$$12(b^2 - 16)$$

$$b^2 - n^2 = (b + n)(b - n)$$

$$12(b + 4)(b - 4)$$

DIF: Basic                    OBJ: 9-6.1 Factor perfect square trinomials.

STO: MI IV.3.3            TOP: Factor perfect square trinomials            KEY: Perfect Squares, Factor Trinomials

MSC: 1998 Lesson 10-5, 1998 Lesson 10-6

NOT: /A/ What did you factor out? /B/ Remember what you factored out and remember to take the square root. /C/ Correct! /D/ What about the square root?

43. ANS: D

$$12x + 12 = 10x + 18 - 12$$

$$12x + 12 = 10x + 6$$

$$12x - 10x + 12 = 10x - 10x + 6$$

$$2x + 12 = 6$$

$$2x + 12 - 12 = 6 - 12$$

$$2x = -6$$

$$\frac{2x}{2} = \frac{-6}{2}$$

$$x = -3$$

DIF: Basic                    OBJ: 8-6.2 Solve equations involving polynomials.

TOP: Solve equations involving polynomials            KEY: Polynomials, Solve Equations

MSC: 1998 Lesson 9-6

NOT: /A/ Be careful subtracting 12 from both sides. /B/ Subtract  $10x$  from both sides. /C/ Multiply the number outside the parentheses by EACH monomial inside. /D/ Correct!

44. ANS: C

$$\begin{aligned}
m^2 - 3m - 2m^2 + 8m &= -m^2 + 4m + 6 \\
-m^2 + 5m &= -m^2 + 4m + 6 \\
-m^2 + m^2 + 5m &= -m^2 + m^2 + 4m + 6 \\
5m &= 4m + 6 \\
5m - 4m &= 4m - 4m + 6 \\
m &= 6
\end{aligned}$$

DIF: Average OBJ: 8-6.2 Solve equations involving polynomials.

TOP: Solve equations involving polynomials

KEY: Polynomials, Solve Equations

MSC: 1998 Lesson 9-6

NOT: /A/ Don't multiply what is added after the parentheses. /B/ Multiply both monomials in the parentheses by what is on the outside. /C/ Correct! /D/ Multiply both monomials in the parentheses by what is on the outside and don't multiply what is added after the parentheses.

45. ANS: C

Either  $r - 3 = 0$  or  $r + 6 = 0$ .

If  $r - 3 = 0$ , then  $r = 3$ .

If  $r + 6 = 0$ , then  $r = -6$ .

DIF: Basic

OBJ: 9-2.3 Solve quadratic equations of the form  $ax^2 + bx = 0$ .

STO: MI IV.3.3

TOP: Solve quadratic equations of the form  $ax^2 + bx = 0$

KEY: Quadratic Equations, Solve Equations

MSC: 1998 Lesson 10-2, 1998 Lesson 10-6

NOT: /A/ Watch your signs. /B/ Remember, either  $r - 3 = 0$  or  $r + 6 = 0$ . /C/ Correct! /D/ Remember, either  $r - 3 = 0$  or  $r + 6 = 0$ .

46. ANS: A

If an equation that contains more than one variable is to be solved for a specific variable, use the properties of equality to isolate the specified variable on one side of the equation.

DIF: Average

OBJ: 3-8.1 Solve equations for given variables.

TOP: Solve equations for given variables

KEY: Solve Equations, Variables

MSC: 1998 Lesson 3-6

NOT: /A/ Correct! /B/ Did you isolate the variable you were solving for on one side of the equal sign? /C/ Did you apply the Addition or Subtraction Property of Equality correctly? /D/ Did you apply the Division Property of Equality?

47. ANS: A

Since the graphs are parallel lines, there are no solutions.

DIF: Basic

OBJ: 7-1.1 Determine whether a system of linear equations has 0, 1, or infinitely many solutions.

TOP: Determine whether a system of linear equations has 0, 1, or infinitely many solutions

KEY: System of Equations, Linear Equations

MSC: 1998 Lesson 8-1

NOT: /A/ Correct! /B/ One solution means that the lines intersect. /C/ If the lines intersect, there is one solution. If they are parallel, there are no solutions. If they are the same line, there is an infinite number of solutions. /D/ Infinitely many means that the two lines are actually the same line.

48. ANS: D

To solve a proportion containing a variable, use cross products and other techniques to solve the equation.

DIF: Basic                    OBJ: 3-6.2 Solve proportions.                    STO: MI IV.3.2  
TOP: Solve proportions                    KEY: Proportions, Solve Proportions  
MSC: 1998 Lesson 4-1  
NOT: /A/ How do you solve a proportion?/B/ Did you find the cross product correctly? /C/ Did you multiply correctly? /D/ Correct!

49. ANS: B

Uniform motion problems are problems where an object moves at a certain speed, or rate. Use the formula  $d = rt$  to solve these problems, where  $d$  is the distance,  $r$  is the rate, and  $t$  is the time. Complete the table using the given information. The sum of the distances the two trains travel is equal to the total distance.

DIF: Average                    OBJ: 3-9.2 Solve uniform motion problems.  
STO: MI II.3.2, MI II.3.5, MI II.3.6                    TOP: Solve uniform motion problems  
KEY: Uniform Motion, Solve Problems                    MSC: 1998 Lesson 4-7  
NOT: /A/ Would the left side be equal to the total distance the trains are apart? /B/ Correct! /C/ Would the right side be equal to the total distance the trains are apart? /D/ Would the left side be equal to the total distance the trains are apart?

50. ANS: A

Uniform motion problems are problems where an object moves at a certain speed, or rate. Use the formula  $d = rt$  to solve these problems, where  $d$  is the distance,  $r$  is the rate, and  $t$  is the time. Complete the table using the given information.

DIF: Average                    OBJ: 3-9.2 Solve uniform motion problems.  
STO: MI II.3.2, MI II.3.5, MI II.3.6                    TOP: Solve uniform motion problems  
KEY: Uniform Motion, Solve Problems                    MSC: 1998 Lesson 4-7  
NOT: /A/ Correct! /B/ How fast were the trains traveling? /C/ Did the eastbound train travel longer? /D/ Were the trains traveling at the same rate of speed?

51. ANS: A

Using key words for operations, translate the equation into a number sentence.

DIF: Average                    OBJ: 3-1.2 Translate equations into verbal sentences.  
STO: MI II.3.2, MI V.2.1                    TOP: Translate equations into verbal sentences  
KEY: Equations, Verbal Sentences                    MSC: 1998 Lesson 2-9  
NOT: /A/ Correct! /B/ What did you translate as the sum? /C/ What is meant by the quotient? /D/ Are you sure about the left side of the equation?

52. ANS: B

Using key words for operations, translate the equation into a number sentence.

DIF: Basic                    OBJ: 3-1.2 Translate equations into verbal sentences.  
STO: MI II.3.2, MI V.2.1                    TOP: Translate equations into verbal sentences  
KEY: Equations, Verbal Sentences                    MSC: 1998 Lesson 2-9  
NOT: /A/ Is there subtraction in the equation? /B/ Correct! /C/ Carefully look at the equation again. /D/ Is there division in the equation?

53. ANS: B

A counterexample is a specific case in which a statement is false. It takes only one counterexample to show that a statement is false.

DIF: Average                    OBJ: 1-7.2 Use a counterexample to show that an assertion is false.  
STO: MI III.3.1, MI III.3.3, MI III.3.4, MI III.3.5, MI VI.2.4  
TOP: Use a counterexample to show that an assertion is false  
KEY: Counterexample, Deductive Reasoning

NOT: /A/ Are the hypothesis and conclusion both true? /B/ Correct! /C/ Is the hypothesis true? /D/ Is the hypothesis true?

54. ANS: B

An expression is in simplest form when it is replaced by an equivalent expression having no like terms or parentheses.

DIF: Basic OBJ: 1-5.2 Use the Distributive Property to simplify expressions.

STO: MI IV.1.1, MI IV.1.4, MI V.1.1, MI V.1.3

TOP: Use the Distributive Property to simplify expressions

KEY: Distributive Property, Simplify Expressions

MSC: 1998 Lesson 1-7

NOT: /A/ Are there no like terms or parentheses? /B/ Correct! /C/ Is there a variable in the second term? /D/ Did you do the Distributive Property correctly?

55. ANS: D

A solution of an equation in two variables is an ordered pair that results in a true statement when substituted into the equation.

DIF: Average OBJ: 4-4.1 Use an equation to determine the range for a given domain.

STO: MI I.1.2, MI I.1.3, MI I.1.4, MI I.1.5, MI V.2.1

TOP: Use an equation to determine the range for a given domain

KEY: Domain, Range

MSC: 1998 Lesson 5-3

NOT: /A/ Is the equation true? /B/ Does substituting for  $x$  and  $y$  result in a true equation? /C/ Does the ordered pair make the equation true? /D/ Correct!

56. ANS: D

To work backward, start with the result given at the end of a problem and undo each step to arrive at the beginning number.

DIF: Average OBJ: 3-4.1 Solve problems by working backward.

STO: MI V.1.3 TOP: Solve problems by working backward

KEY: Solve Problems, Work Backward MSC: 1998 Lesson 3-3

NOT: /A/ Did you subtract in the first step? /B/ Did you divide carefully in the second step? /C/ Did you subtract in the second step? /D/ Correct!

57. ANS: C

The linear equation  $y = mx + b$  is written in slope-intercept form, where  $m$  is the slope and  $b$  is the  $y$ -intercept.

DIF: Basic OBJ: 5-3.1 Write and graph linear equations in slope-intercept form.

STO: MI I.2.1, MI I.2.6, MI III.1.1, MI III.1.4, MI III.2.1

TOP: Write and graph linear equations in slope-intercept form

KEY: Slope-Intercept Form, Linear Equations, Graphs

MSC: 1998 Lesson 6-4

NOT: /A/ What is the slope? /B/ What is the  $y$ -intercept? /C/ Correct! /D/ What is the slope of the line?

58. ANS: A

The absolute value of any number is its distance from zero on a number line.

DIF: Basic OBJ: 2-1.5 Find absolute value of fractions.

STO: MI III.1.1, MI III.1.4, MI IV.1.4, MI IV.2.5, MI IV.3.1 TOP: Find absolute value of fractions

KEY: Fractions, Absolute Value

MSC: 1998 Lesson 2-1, 1998 Lesson 2-3

NOT: /A/ Correct! /B/ Is the distance from zero equal to zero? /C/ That is the absolute value of the reciprocal. /D/ Can the distance from zero be negative?

59. ANS: A

Find the amount of discount by multiplying the discount rate converted to a decimal. Subtract the amount of discount from the original price. Compute the tax on the discounted price.

DIF: Average      OBJ: 3-7.2 Solve problems involving percents of change.  
TOP: Solve problems involving percents of change      KEY: Percent of Change, Solve Problems  
MSC: 1998 Lesson 4-5  
NOT: /A/ Correct! /B/ Did you forget to add the tax? /C/ Did you subtract the discount? /D/ Did you subtract the tax?

60. ANS: C

If a quantity changes at a constant rate over time, it can be modeled by a linear equation. The y-intercept represents a starting point, and the slope represents the rate of change.

DIF: Average      OBJ: 5-3.2 Model real-world data with an equation in slope-intercept form.  
STO: MI I.2.2, MI I.2.5, MI I.2.6, MI III.1.1, MI III.1.2  
TOP: Model real-world data with an equation in slope-intercept form  
KEY: Slope-Intercept Form, Equations, Real-World Problems      MSC: 1998 Lesson 6-4  
NOT: /A/ How many sections did he install each Saturday? /B/ How many sections were standing at the beginning? /C/ Correct! /D/ How many Saturdays did you use?

61. ANS: B

Each term of an arithmetic sequence after the first term can be found by adding the common difference to the preceding term.

DIF: Average      OBJ: 4-7.2 Extend and write formulas for arithmetic sequences.  
STO: MI I.1.1, MI I.1.4, MI I.1.5, MI V.2.1  
TOP: Extend and write formulas for arithmetic sequences      KEY: Sequences, Arithmetic Sequences  
MSC: 1998 Lesson 1-2  
NOT: /A/ Is the fifth term the result of adding the common difference to the fourth term? /B/ Correct! /C/ What is the common difference? /D/ What is the common difference?

62. ANS: A

The odds of an event occurring is the ratio that compares the number of ways an event can occur (successes) to the number of ways it cannot occur (failures).

DIF: Average      OBJ: 2-6.2 Find the odds of a simple event.  
STO: MI VI.1.1, MI VI.1.2, MI VI.1.4, MI VI.1.5      TOP: Find the odds of a simple event  
KEY: Odds, Simple Events      MSC: 1998 Lesson 4-6  
NOT: /A/ Correct! /B/ How many ways can the event fail to occur? /C/ Isn't that the probability of spinning a multiple of 3? /D/ How many ways can the event fail to occur?

63. ANS: C

The odds of an event occurring is the ratio that compares the number of ways an event can occur (successes) to the number of ways it cannot occur (failures).

DIF: Average      OBJ: 2-6.2 Find the odds of a simple event.  
STO: MI VI.1.1, MI VI.1.2, MI VI.1.4, MI VI.1.5      TOP: Find the odds of a simple event  
KEY: Odds, Simple Events      MSC: 1998 Lesson 4-6  
NOT: /A/ How many ways can the event fail to occur? /B/ How many ways can the event occur? /C/ Correct! /D/ Did you find odds, or probability?

64. ANS: D

The axis of symmetry for  $y = ax^2 + bx + c$  is  $x = -\frac{b}{2a}$ . In this case  $x = -\frac{3}{2}$ .

Substituting in the original equation, the vertex is  $\left(-\frac{3}{2}, -1\frac{1}{4}\right)$ .

Because  $a$  is positive, the parabola opens upward.

DIF: Basic                    OBJ: 10-1.1 Graph quadratic functions.                    TOP: Graph quadratic functions

KEY: Graphs, Quadratic Functions                    MSC: 1998 Lesson 11-1

NOT: /A/ If the  $x$  squared term is positive, the parabola opens upward. /B/ If the  $x$  squared term is positive, the parabola opens upward. /C/ Don't forget to add the number at the end. /D/ Correct!

65. ANS: C

Invert negative powers. When dividing, subtract the bottom exponent from the top exponent with the same base. If the answer is negative, the result goes on the bottom. If positive, the result goes on top.

DIF: Average                    OBJ: 8-2.2 Simplify expressions containing negative exponents.

STO: MI I.1.2, MI I.2.5, MI II.3.2, MI IV.3.4, MI IV.3.5

TOP: Simplify expressions containing negative exponents

KEY: Simplify Expressions, Negative Exponents                    MSC: 1998 Lesson 9-2

NOT: /A/ Subtract bottom exponent from top. /B/ The variable  $p$  has a negative exponent. /C/ Correct! /D/ Subtract bottom exponent from top. If the exponent is negative, answer goes on bottom.

66. ANS: C

The slope  $m$  of a nonvertical line through any two points is the ratio of the difference of the  $y$ -coordinates to the difference of the  $x$ -coordinates. A vertical line has an undefined slope.

DIF: Basic                    OBJ: 5-1.2 Use rate of change to solve problems.

STO: MI I.2.1, MI I.2.2, MI I.2.5, MI I.2.6, MI III.1.1

TOP: Use rate of change to solve problems

KEY: Rate of Change, Solve Problems

MSC: 1998 Lesson 6-1

NOT: /A/ Is the belt vertical? /B/ Is that the run over the rise? /C/ Correct! /D/ Is the belt horizontal?

67. ANS: C

Add the exponents of the variables only.

DIF: Basic                    OBJ: 8-4.1 Find the degree of a polynomial.

TOP: Find the degree of a polynomial                    KEY: Polynomials, Degree of Polynomial

MSC: 1998 Lesson 9-4

NOT: /A/ Add only the exponents. /B/ Add the exponents of the variables. /C/ Correct! /D/ Add both exponents.

68. ANS: A

Eliminate one variable by adding the two equations. Solve for  $y$  and then substitute that value into one of the equations to find the value of  $x$ .

DIF: Average                    OBJ: 7-3.1 Solve systems of equations by using elimination with addition.

TOP: Solve systems of equations by using elimination with addition

KEY: System of Equations, Elimination, Addition                    MSC: 1998 Lesson 8-3

NOT: /A/ Correct! /B/ Add the equations together. /C/ Add the equations together. /D/ Double-check your positive and negative signs.

69. ANS: C

Graph the lines as boundaries. If the inequality is "less than or equal to" or "greater than or equal to," the boundary line will be solid to include the points on the line. If the inequality is "less than" or "greater than," the boundary line will be dotted to not include the points on the line. For each line, shade the half-plane that satisfies the inequality. The solution is the set of points where the shading overlaps.

DIF: Average                    OBJ: 7-5.1 Solve systems of inequalities by graphing.

STO: MI V.2.3                    TOP: Solve systems of inequalities by graphing

KEY: System of Inequalities, Graphing MSC: 1998 Lesson 8-5

NOT: /A/ Be sure that you shaded the correct half planes. /B/ A solid line means that the points on the line are included in the solution, and a dotted line means they are not included. /C/ Correct! /D/ Be sure that you graphed the correct equations.

70. ANS: D

Substitute the right side of the top equation for  $y$  in the bottom equation. Solve for  $x$ . Substitute the value obtained for  $x$  into the top equation and solve for  $y$ .

DIF: Average OBJ: 7-2.1 Solve systems of equations by using substitution.

STO: MI I.1.2, MI I.1.5, MI III.1.2, MI III.1.3, MI III.1.4

TOP: Solve systems of equations by using substitution

KEY: System of Equations, Substitution

MSC: 1998 Lesson 8-2

NOT: /A/ Remember to list the  $x$ -coordinate first and then the  $y$ -coordinate. /B/ Use parentheses when you substitute for  $y$  and then remember to distribute the negative sign through the parentheses. /C/ Terms with different variables cannot be combined. /D/ Correct!

71. ANS: C

Make a table of ordered pairs for several points on the graph. Use patterns you see in the table to help write and equation in function notation.

DIF: Average OBJ: 4-8.2 Write an equation given some of the solutions.

STO: MI I.1.1, MI I.1.2, MI I.1.3, MI I.1.4, MI I.1.5

TOP: Write an equation given some of the solutions

KEY: Equations, Solutions

MSC: 1998 Lesson 1-2, 1998 Lesson 5-6

NOT: /A/ Do the ordered pairs make this equation true? /B/ Did you look for a pattern? /C/ Correct! /D/ Did you make a table of ordered pairs?

72. ANS: A

Let the expression inside the absolute value symbols be less than the constant on the right and greater than the opposite of the constant. Solve each inequality. This will give two solutions.

DIF: Basic OBJ: 6-5.2 Solve absolute value inequalities.

STO: MI V.2.2, MI V.2.3

TOP: Solve absolute value inequalities

KEY: Absolute Value, Inequalities

MSC: 1998 Lesson 7-6

NOT: /A/ Correct! /B/ Let the expression inside the absolute value symbols be less than the constant on the right. /C/ Let the expression inside the absolute value symbols be greater than the opposite of the constant on the right. /D/ Let the expression inside the absolute value symbols be both less than the constant on the right and greater than its opposite.

73. ANS: D

Find the  $y$ -intercept by replacing  $x$  and  $y$  with the given point and  $m$  with the given slope in the slope-intercept form. Solve for  $b$ . Write the equation in slope-intercept form using the given  $m$  and the calculated  $b$ .

DIF: Average OBJ: 5-4.1 Write an equation of a line given the slope and one point on a line.

STO: MI I.2.2, MI III.1.1, MI III.1.4, MI III.2.1

TOP: Write an equation of a line given the slope and one point on a line

KEY: Slope, Equations, Lines

MSC: 1998 Lesson 6-4

NOT: /A/ What is the  $y$ -intercept? /B/ What is the  $y$ -intercept? /C/ What is the slope of the line? /D/ Correct!

74. ANS: B

You can often solve an equation by applying the order of operations.

DIF: Average OBJ: 1-3.1 Solve open sentence equations.

STO: MI V.2.5

TOP: Solve open sentence equations

KEY: Equations, Solve Equations

MSC: 1998 Lesson 1-5

NOT: /A/ Did you multiply instead of adding? /B/ Correct! /C/ Be careful with addition./D/ Did you forget to add the whole number?

75. ANS: D

Two variables,  $m$  and  $n$ , exist such that  $g^2 + (m + n)g + (m \times n)$ .

$m + n = -9$  and  $m \times n = -22$ .

Make a table to find the possible solutions.

The correct factors are 2 and  $-11$ .

DIF: Average      OBJ: 9-3.1 Factor trinomials of the form  $x^2 + bx + c$ .

STO: MI IV.3.3      TOP: Factor trinomials of the form  $x^2 + bx + c$

KEY: Factor Trinomials      MSC: 1998 Lesson 10-3, 1998 Lesson 10-6

NOT: /A/ Watch your signs. /B/ Remember,  $m + n =$  the middle number and  $m * n =$  the last number. /C/ Remember,  $m + n =$  the middle number and  $m * n =$  the last number./D/ Correct!