

Functions and Linear Equations Practice Test

Multiple Choice

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

Solve the equation.

_____ 1. $3y + 20 = 3 + 2y$

- a. $-\frac{1}{17}$ b. $7\frac{2}{3}$ c. 23 d. -17

Use an algebraic equation to solve the problem.

_____ 2. The sides of a triangle are in the ratio 3 : 4 : 5. What is the length of each side if the perimeter of the triangle is 90 cm?

- a. 10.5 cm, 11.5 cm, and 12.5 cm c. 7.5 cm, 11.5 cm, and 32.1 cm
 b. 22.5 cm, 30 cm, and 37.5 cm d. 19.3 cm, 25.7 cm, and 32.1 cm

What inequality represents the sentence?

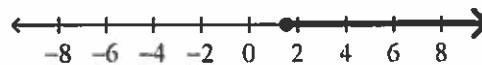
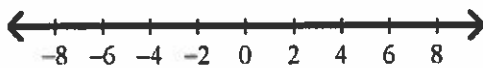
_____ 3. The product of a number and 12 is no more than 15.

- a. $12n < 15$ c. $12n \geq 15$
 b. $12n > 15$ d. $12n \leq 15$

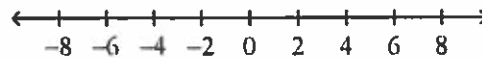
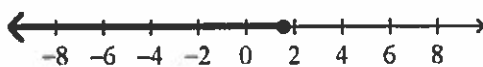
Solve the inequality. Graph the solution set.

_____ 4. $26 + 6b \geq 2(3b + 4)$

- a. all real numbers c. $b \geq 1\frac{1}{2}$



- b. $b \leq 1\frac{1}{2}$ d. no solutions



Is the inequality sometimes, always, or never true?

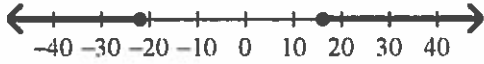
_____ 5. $2(10x - 5) - 9x \leq 11x + 13$

- a. always b. sometimes c. never

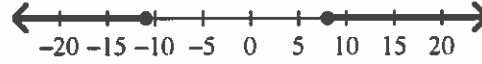
Solve the inequality. Graph the solution.

6. $|2x + 3| \geq 19$

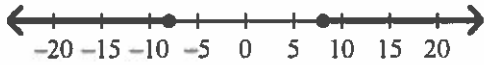
a. $x \leq -22$ or $x \geq 16$



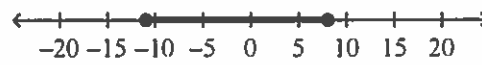
c. $x \leq -11$ or $x \geq 8$



b. $x \leq -8$ or $x \geq 8$



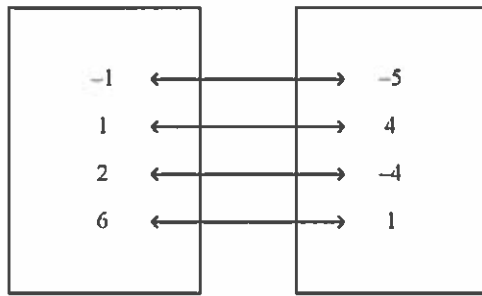
d. $x \geq -11$ or $x \leq 8$



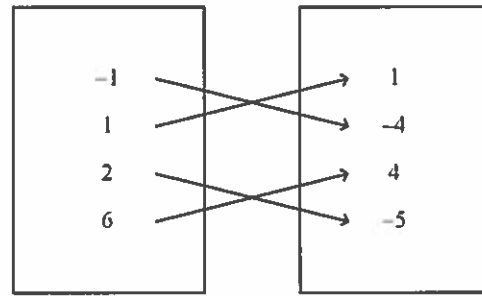
7. Make a mapping diagram for the relation.

$\{(-1, -5), (1, 4), (2, -4), (6, 1)\}$

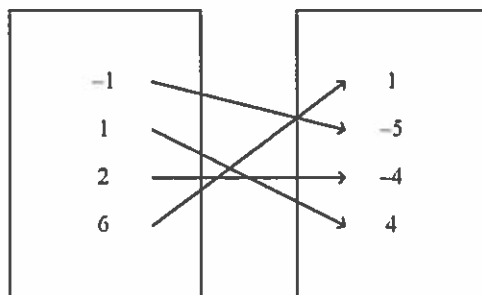
a.



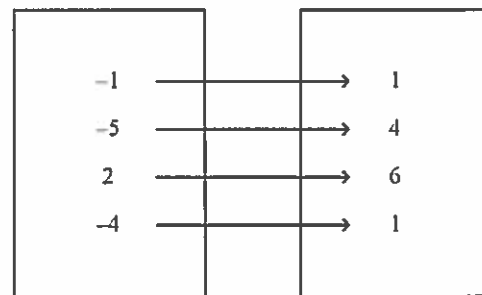
c.



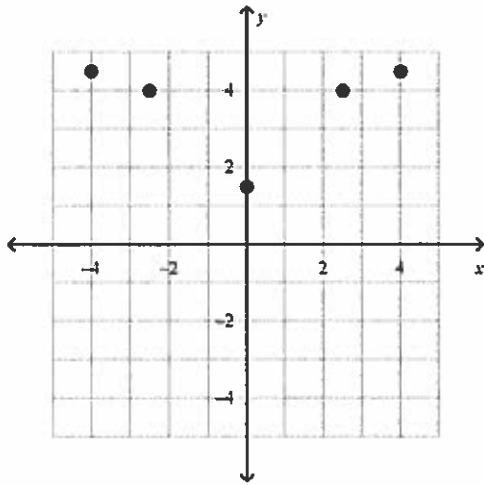
b.



d.



_____ 8. Find the domain and range of the relation.



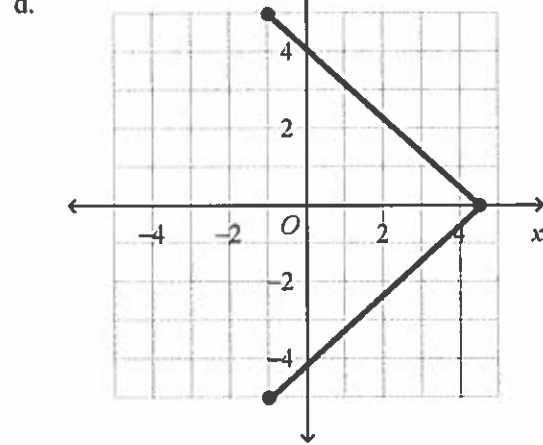
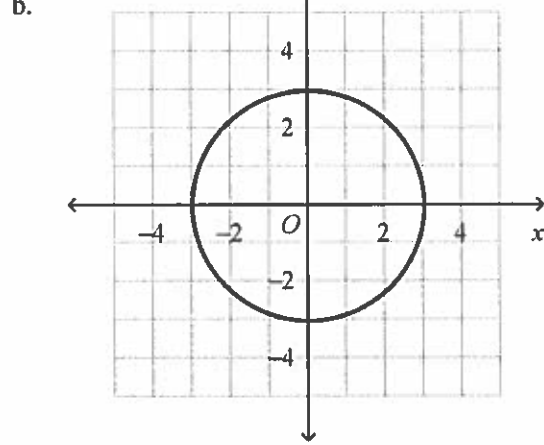
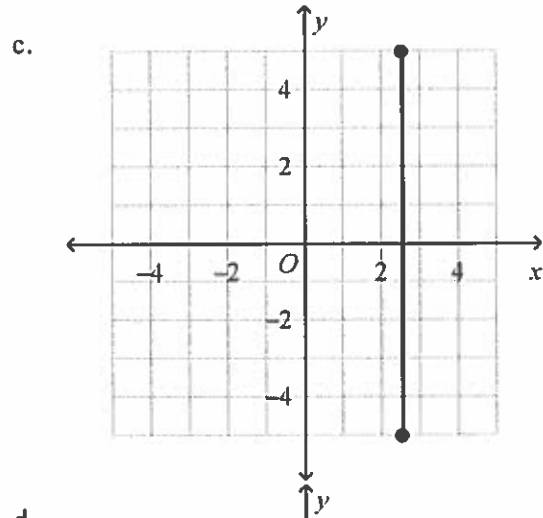
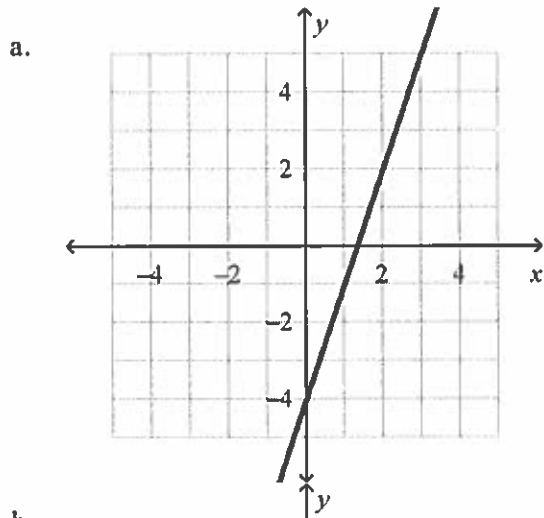
- a. domain: $\{-4, -2.5, 0, 2.5, 4\}$; range: $\{4.5, 4, 1.5\}$
- b. domain: $\{-4, -2.5, 2.5, 4\}$; range: $\{4.5, 4, 1.5\}$
- c. domain: $\{4.5, 4, 1.5\}$; range: $\{-4, -2.5, 2.5, 4\}$
- d. domain: $\{4.5, 4, 1.5\}$; range: $\{-4, -2.5, 0, 2.5, 4\}$

Is the relation a function?

_____ 9. $\{(14, 15), (5, 7), (3, 10), (11, 1), (5, 8)\}$

- a. yes
- b. no

10. Use the vertical-line test to determine which graph represents a function.



For each function, what is the output of the given input?

11. For $f(x) = -5x + 1$, find $f(3)$.

- a. -2 b. -14 c. 16 d. -16

12. Specialty t-shirts are being sold online for \$35 plus a one-time handling fee of \$1.75. The total cost is a function of the number of t-shirts bought. What function rule models the cost of the t-shirts? Evaluate the function for 6 t-shirts.

- a. $1.75t + 35$; \$211.75 c. $1.75t + 35$; \$45.5
 b. $35t + 1.75$; \$211.75 d. $35t + 1.75$; \$45.5

Write the equation in slope-intercept form. What are the slope and y-intercept?

_____ 13. $-8x + 3y = -10$

a. $y = \frac{8}{3}x + \frac{10}{3};$

slope: $\frac{10}{3};$ y-intercept: $\frac{8}{3}$

b. $y = \frac{8}{3}x - \frac{10}{3};$

slope: $\frac{8}{3};$ y-intercept: $-\frac{10}{3}$

c. $y = -\frac{8}{3}x - \frac{10}{3};$

slope: $\frac{8}{3};$ y-intercept: $\frac{10}{3}$

d. $y = -\frac{8}{3}x + \frac{10}{3}$

slope: $\frac{8}{3};$ y-intercept: $\frac{10}{3}$

Write an equation of the line, in point-slope form, that passes through the two given points.

_____ 14. points: $(-5, 5), (15, -5)$

a. $(y + 5) = -\frac{1}{2}(x - 5)$

b. $(y - 5) = -2(x + 5)$

c. $(y - 5) = -\frac{1}{2}(x + 5)$

d. $(y + 5) = -2(x - 5)$

What is the equation of the given line in standard form? Use integer coefficients.

_____ 15. $y = \frac{5}{8}x - 9$

a. $5x + 8y = -72$

b. $-5x + 8y = -9$

c. $-5x - 8y = -72$

d. $-5x + 8y = -72$

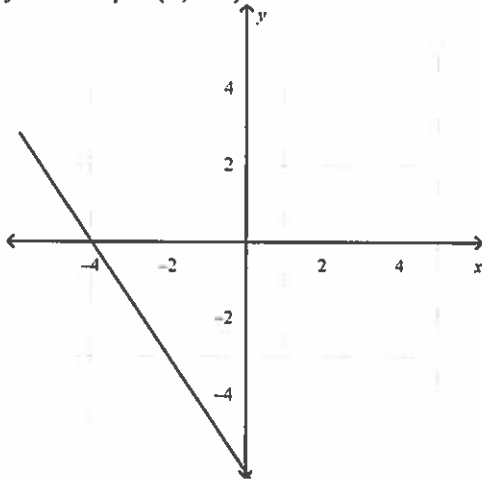
Name: _____

ID: A

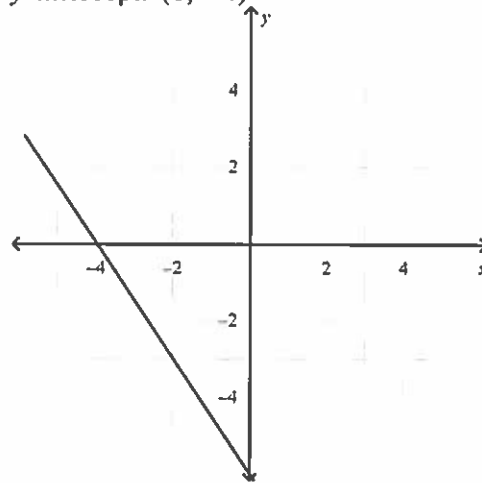
What are the intercepts of the equation? Graph the equation.

16. $-4x - 6y = 24$

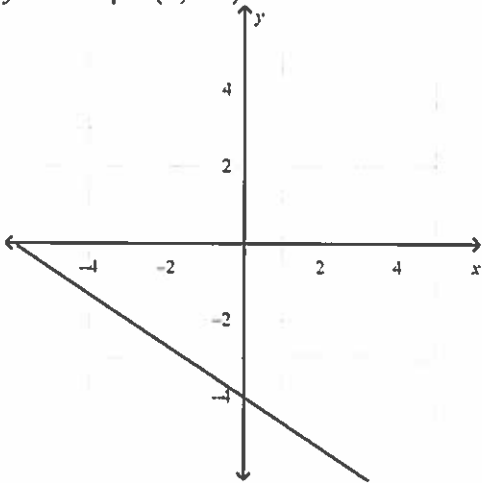
- a. x -intercept: $(-4, 0)$
 y -intercept: $(0, -6)$



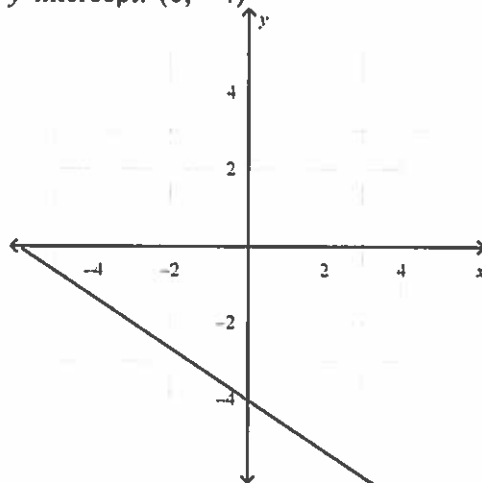
- c. x -intercept: $(-6, 0)$
 y -intercept: $(0, -4)$



- b. x -intercept: $(-4, 0)$
 y -intercept: $(0, -6)$



- d. x -intercept: $(-6, 0)$
 y -intercept: $(0, -4)$



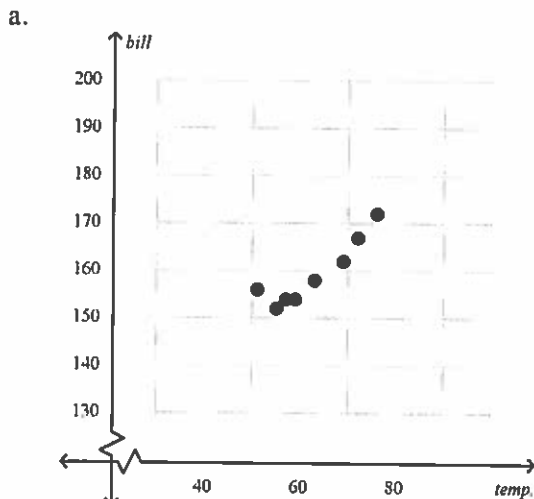
Name: _____

ID: A

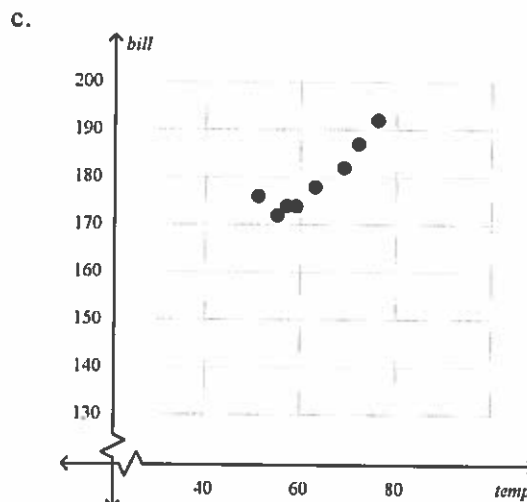
Make a scatter plot and describe the correlation.

- _____ 17. The table lists average monthly temperatures and electricity cost for a Texas home in 2008. The table displays the values rounded to the nearest whole number. Make a scatter plot. How would you describe the correlation?

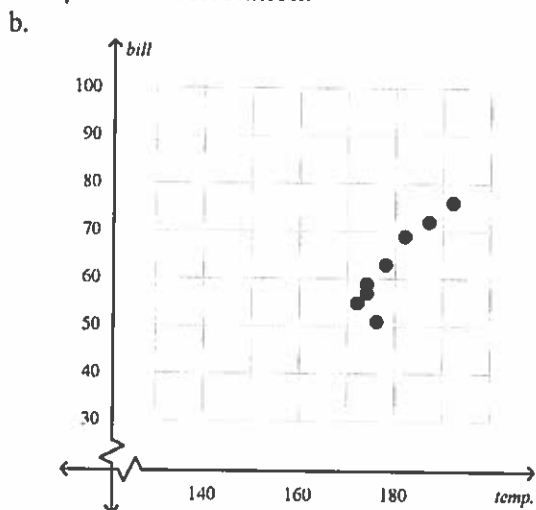
Month	Average Temp (°F)	Electricity Bill (\$)
<i>January</i>	57	154
<i>February</i>	51	156
<i>March</i>	55	152
<i>April</i>	59	154
<i>May</i>	63	158
<i>June</i>	69	162
<i>July</i>	72	167
<i>August</i>	76	172



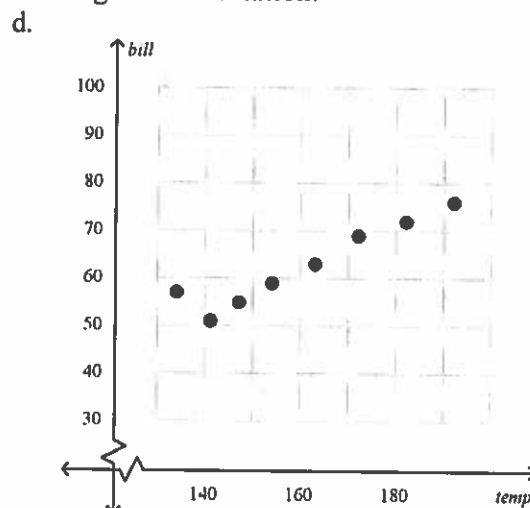
As temperature increases, the electricity cost increases; there is a positive correlation.



As temperature increases, the electricity cost increases; there is a negative correlation.



As temperature increases, the electricity cost decreases; there is a positive correlation.



As temperature increases, the cost of electricity decreases; there is a negative correlation.

18. The table shows the median home prices in Florida. What is the equation of a trend line that models a relationship between time and home prices? Use the equation to predict the median home price in 2020.

Year	1940	1950	1960	1970	1980	1990	2000
Median Price(\$)	\$25,600	\$36,800	\$58,200	\$60,600	\$88,700	\$95,400	\$110,100

- a. $y = 1408.33x + 25,600$; \$110,100
 b. $y = 42.25x + 25,600$; \$110,100
 c. $y = 1408.33x + 25,600$; \$138,300
 d. $y = 42.25x + 25,600$; \$138,300

19. You research the average cost of whole milk for several recent years to look for trends. The table shows your data. What is the equation for a line of best fit? How much would you expect to pay for a gallon of whole milk in the year 2020?

Year	1998	2000	2002	2004	2006	2008
Average cost for one gallon (\$)	\$2.62	\$2.76	\$2.97	\$2.98	\$3.22	\$3.78

- a. $y = 0.099x + 2.62$; \$4.79 c. $y = 2.62x + 0.099$; \$5.95
 b. $y = 2.62x + 0.099$; \$4.79 d. $y = 0.099x + 2.62$; \$5.95

The rate of change is constant in each table. Find the rate of change. Explain what the rate of change means for the situation.

20. The table shows the number of miles driven over time.

Time (hours)	Distance (miles)
4	204
6	306
8	408
10	510

- a. $\frac{51}{1}$; Your car travels 51 miles every 1 hour.
 b. 204; Your car travels 204 miles.
 c. $\frac{1}{51}$; Your car travels 51 miles every 1 hour.
 d. 10; Your car travels for 10 hours.

What is the slope of the line that passes through the pair of points?

21. $(-5.5, 6.1), (-2.5, 3.1)$

- a. -1 b. 1 c. -1 d. 1

What equation in slope intercept form represents the line that passes through the two points?

22. $(6.9, 5.9), (10.9, -2.1)$

- a. $y = 0.5x - 19.7$ c. $y = -0.5x - 19.7$
 b. $y = 2x + 19.7$ d. $y = -2x + 19.7$

Find the x - and y -intercept of the line.

23. $-6.9x - 7.8y = 71.76$

- a. x -intercept is -7.8 ; y -intercept is -6.9 c. x -intercept is -10.4 ; y -intercept is -9.2
 b. x -intercept is -9.2 ; y -intercept is -10.4 d. x -intercept is -6.9 ; y -intercept is -7.8

_____ 24. Write $y = \frac{2}{3}x + 7$ in standard form using integers.

a. $-2x + 3y = 21$

c. $-2x - 3y = 21$

b. $3x - 2y = 21$

d. $-2x + 3y = 7$

Write an equation for the line that is parallel to the given line and passes through the given point.

_____ 25. $y = \frac{1}{5}x - 10$; $(15, -16)$

a. $y = -5x + 19$

c. $y = \frac{1}{5}x - 19$

b. $y = \frac{1}{5}x + \frac{91}{5}$

d. $y = 5x - 19$

Write the equation of a line that is perpendicular to the given line and that passes through the given point.

_____ 26. $y = -\frac{10}{9}x - \frac{22}{9}$; $(4, 2)$

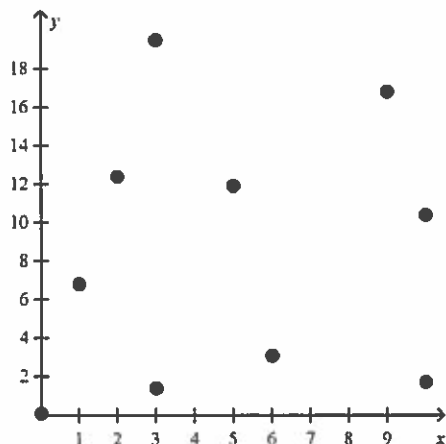
a. $y = \frac{9}{10}x - \frac{8}{5}$

c. $y = -\frac{9}{10}x - \frac{8}{5}$

b. $y = \frac{9}{10}x - \frac{22}{9}$

d. $y = -\frac{9}{10}x - \frac{22}{9}$

_____ 27.



- a. positive correlation
- b. negative correlation
- c. no correlation

Functions and Linear Equations Practice Test

Answer Section

MULTIPLE CHOICE

1. ANS: D PTS: 1 DIF: L2 REF: 1-4 Solving Equations
OBJ: 1-4.1 To solve equations NAT: A.2.a| A.4.c STA: L1.2.1| A1.2.8| A1.2.9
TOP: 1-4 Problem 2 Solving a Multi-Step Equation
KEY: equation | solution of an equation | inverse operations DOK: DOK 1
2. ANS: B PTS: 1 DIF: L3 REF: 1-4 Solving Equations
OBJ: 1-4.2 To solve problems by writing equations NAT: A.2.a| A.4.c
STA: L1.2.1| A1.2.8| A1.2.9 TOP: 1-4 Problem 3 Using an Equation to Solve a Problem
KEY: equation | solution of an equation DOK: DOK 2
3. ANS: D PTS: 1 DIF: L3 REF: 1-5 Solving Inequalities
OBJ: 1-5.1 To solve and graph inequalities NAT: A.2.a| A.3.b| A.3.d| A.4.c
STA: L1.2.1 TOP: 1-5 Problem 1 Writing an Inequality from a Sentence
KEY: compound inequality | word problem | problem solving DOK: DOK 1
4. ANS: A PTS: 1 DIF: L3 REF: 1-5 Solving Inequalities
OBJ: 1-5.1 To solve and graph inequalities NAT: A.2.a| A.3.b| A.3.d| A.4.c
STA: L1.2.1 TOP: 1-5 Problem 2 Solving and Graphing an Inequality
DOK: DOK 2
5. ANS: A PTS: 1 DIF: L3 REF: 1-5 Solving Inequalities
OBJ: 1-5.1 To solve and graph inequalities NAT: A.2.a| A.3.b| A.3.d| A.4.c
STA: L1.2.1 TOP: 1-5 Problem 4 No Solution or All Real Numbers as Solution
KEY: DOK: DOK 2
6. ANS: C PTS: 1 DIF: L3 REF: 1-6 Absolute Value Equations and Inequalities
OBJ: 1-6.1 To write and solve equations and inequalities involving absolute value
NAT: N.1.g| N.3.c| A.2.a| A.4.c STA: L1.2.1
TOP: 1-6 Problem 5 Solving the Absolute Value Inequality; "greater than"
KEY: absolute value DOK: DOK 2
7. ANS: B PTS: 1 DIF: L2 REF: 2-1 Relations and Functions
OBJ: 2-1.1 To graph relations NAT: A.1.g| A.1.i| A.2.b| A.3.f
STA: L1.2.1| A2.1.1| A2.1.2| A2.1.3 TOP: 2-1 Problem 1 Representing a Relation
KEY: relation DOK: DOK 1
8. ANS: A PTS: 1 DIF: L2 REF: 2-1 Relations and Functions
OBJ: 2-1.1 To graph relations NAT: A.1.g| A.1.i| A.2.b| A.3.f
STA: L1.2.1| A2.1.1| A2.1.2| A2.1.3 TOP: 2-1 Problem 1 Representing a Relation
KEY: domain | range | relation DOK: DOK 1
9. ANS: B PTS: 1 DIF: L2 REF: 2-1 Relations and Functions
OBJ: 2-1.2 To identify functions NAT: A.1.g| A.1.i| A.2.b| A.3.f
STA: L1.2.1| A2.1.1| A2.1.2| A2.1.3 TOP: 2-1 Problem 3 Identifying Functions
KEY: function | relation DOK: DOK 1
10. ANS: A PTS: 1 DIF: L2 REF: 2-1 Relations and Functions
OBJ: 2-1.2 To identify functions NAT: A.1.g| A.1.i| A.2.b| A.3.f
STA: L1.2.1| A2.1.1| A2.1.2| A2.1.3 TOP: 2-1 Problem 4 Using the Vertical-Line Test
KEY: vertical-line test | function DOK: DOK 1

11. ANS: B PTS: 1 DIF: L2 REF: 2-1 Relations and Functions
 OBJ: 2-1.2 To identify functions NAT: A.1.g| A.1.i| A.2.b| A.3.f
 STA: L1.2.1| A2.1.1| A2.1.2| A2.1.3 TOP: 2-1 Problem 5 Using Function Notation
 KEY: function notation DOK: DOK 1
12. ANS: B PTS: 1 DIF: L3 REF: 2-1 Relations and Functions
 OBJ: 2-1.2 To identify functions NAT: A.1.g| A.1.i| A.2.b| A.3.f
 STA: L1.2.1| A2.1.1| A2.1.2| A2.1.3 TOP: 2-1 Problem 6 Writing and Evaluating a Function
 KEY: function rule DOK: DOK 2
13. ANS: B PTS: 1 DIF: L3
 REF: 2-3 Linear Functions and Slope-Intercept Form OBJ: 2-3.1 To graph linear equations
 NAT: G.4.d| A.1.b| A.2.b STA: L1.2.1| A2.1.3
 TOP: 2-3 Problem 3 Writing Equations in Slope-Intercept Form
 KEY: linear equation | slope | y-intercept DOK: DOK 1
14. ANS: C PTS: 1 DIF: L3 REF: 2-4 More About Linear Equations
 OBJ: 2-4.1 To write an equation of a line given its slope and a point on the line
 NAT: G.4.d| A.2.a| A.2.b STA: L1.2.1
 TOP: 2-4 Problem 2 Writing an Equation Given Two Points KEY: linear equation
 DOK: DOK 2
15. ANS: D PTS: 1 DIF: L2 REF: 2-4 More About Linear Equations
 OBJ: 2-4.1 To write an equation of a line given its slope and a point on the line
 NAT: G.4.d| A.2.a| A.2.b STA: L1.2.1
 TOP: 2-4 Problem 3 Writing an Equation in Standard Form KEY: standard form of a linear equation
 DOK: DOK 2
16. ANS: D PTS: 1 DIF: L3 REF: 2-4 More About Linear Equations
 OBJ: 2-4.1 To write an equation of a line given its slope and a point on the line
 NAT: G.4.d| A.2.a| A.2.b STA: L1.2.1
 TOP: 2-4 Problem 4 Graphing an Equation Using Intercepts DOK: DOK 2
17. ANS: A PTS: 1 DIF: L3 REF: 2-5 Using Linear Models
 OBJ: 2-5.1 To write linear equations that model real-world data
 NAT: A.2.e| D.1.c| D.2.e| D.2.f| D.5.d STA: A2.4.3
 TOP: 2-5 Problem 1 Using a Scatter Plot KEY: scatter plot
 DOK: DOK 2
18. ANS: C PTS: 1 DIF: L2 REF: 2-5 Using Linear Models
 OBJ: 2-5.1 To write linear equations that model real-world data
 NAT: A.2.e| D.1.c| D.2.e| D.2.f| D.5.d STA: A2.4.3
 TOP: 2-5 Problem 2 Writing the Equation of a Trend Line KEY:
 DOK: DOK 3
19. ANS: A PTS: 1 DIF: L3 REF: 2-5 Using Linear Models
 OBJ: 2-5.1 To write linear equations that model real-world data
 NAT: A.2.e| D.1.c| D.2.e| D.2.f| D.5.d STA: A2.4.3
 TOP: 2-5 Problem 3 Finding the Line of Best Fit KEY: line of best fit
 DOK: DOK 3
20. ANS: A PTS: 1 DIF: L3 REF: 5-1 Rate of Change and Slope
 OBJ: 5-1.1 To find rates of change from tables NAT: A.2.a| A.2.b
 STA: A2.1.3| A3.1.1 TOP: 5-1 Problem 1 Finding Rate of Change Using a Table
 KEY: rate of change DOK: DOK 1

21. ANS: A PTS: 1 DIF: L3 REF: 5-1 Rate of Change and Slope
 OBJ: 5-1.2 To find slope NAT: A.2.a| A.2.b STA: A2.1.3| A3.1.1
 TOP: 5-1 Problem 3 Finding Slope Using Points KEY: slope
 DOK: DOK 1
22. ANS: D PTS: 1 DIF: L3 REF: 5-3 Slope-Intercept Form
 OBJ: 5-3.1 To write linear equations using slope-intercept form
 NAT: A.2.a| A.2.b STA: A2.1.3| A3.1.1| A3.1.2| A3.1.3
 TOP: 5-3 Problem 4 Writing an Equation From Two Points
 KEY: linear equation | y-intercept | slope-intercept form DOK: DOK 1
23. ANS: C PTS: 1 DIF: L3 REF: 5-5 Standard Form
 OBJ: 5-5.1 To graph linear equations using intercepts NAT: A.2.a| A.2.b
 STA: A2.1.3| A3.1.1| A3.1.2| A3.1.3 TOP: 5-5 Problem 1 Finding x- and y-intercepts
 KEY: x-intercept | standard form of a linear equation DOK: DOK 1
24. ANS: A PTS: 1 DIF: L3 REF: 5-5 Standard Form
 OBJ: 5-5.2 To write linear equations in standard form NAT: A.2.a| A.2.b
 STA: A2.1.3| A3.1.1| A3.1.2| A3.1.3 TOP: 5-5 Problem 4 Transforming to Standard Form
 KEY: standard form of a linear equation DOK: DOK 1
25. ANS: C PTS: 1 DIF: L3
 REF: 5-6 Parallel and Perpendicular Lines
 OBJ: 5-6.2 To write equations of parallel lines and perpendicular lines
 NAT: A.2.a| A.2.b STA: A3.1.4 TOP: 5-6 Problem 1 Writing an Equation of a Parallel Line
 KEY: parallel lines DOK: DOK 1
26. ANS: A PTS: 1 DIF: L4
 REF: 5-6 Parallel and Perpendicular Lines
 OBJ: 5-6.2 To write equations of parallel lines and perpendicular lines
 NAT: A.2.a| A.2.b STA: A3.1.4
 TOP: 5-6 Problem 3 Writing an Equation of a Perpendicular Line
 KEY: perpendicular lines DOK: DOK 1
27. ANS: C PTS: 1 DIF: L3 REF: 5-7 Scatter Plots and Trend Lines
 OBJ: 5-7.1 To write an equation of a trend line and of a line of best fit
 NAT: D.1.c| D.2.e| D.5.d| A.2.a| A.2.b STA: L1.2.4| S2.1.1| S2.1.2| S2.1.4
 TOP: 5-7 Problem 1 Making a Scatter Plot and Describing Its Correlation
 KEY: scatter plot DOK: DOK 2

