

Midterm Make-Up

Name _____

Date _____

To make-up missed points for the midterm exam, this worksheet and interview with me must be completed no later than **Dec. 4, 2003 at noon**. Since the answers are provided for you, **each problem must show every step**. In addition, **the steps**, including properties you used, **must be written out**. Lastly, you must make **an appointment to see me** to go over any questions I may have about your explanations. The purpose of this exercise is to prove that you understand the concepts from this course. Please meet with your peers, tutors or even with me to complete this assignment. The number of points awarded are subjective, meaning the final score for your midterm depends on what I feel you have learned in this course. **Completing this activity will be worth at least 10 points toward the midterm and the total score for the midterm will not exceed 80%.**

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Answer the question according to what the textbook states.

- 1) Which of these is NOT a tip to help you succeed in this course?
 - A) Hand in assignments on time.
 - B) Know how to get help if you need it.
 - C) Miss classes.
 - D) Exchange names and phone numbers with at least one other person in class.
 - E) Take notes and review them.

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Multiply the fractions. Write the answer in lowest terms.

2) $4 \cdot \frac{69}{14}$

Divide the fractions. Write the answer in lowest terms.

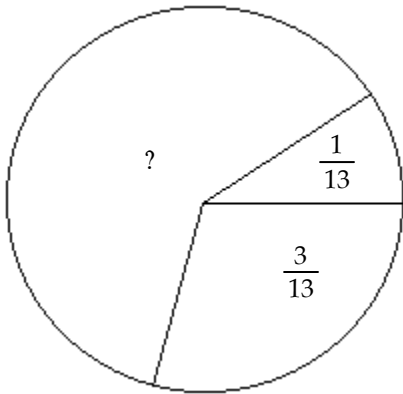
3) $\frac{8}{15} \div \frac{7}{13}$

Add the fractions. Write answer in lowest terms.

4) $\frac{1}{11} + \frac{8}{15}$

The circle represents a whole, or 1. Determine the unknown part of the circle.

5)



6) Explain why the product of an even number of positive and negative numbers is positive.

7) Explain the difference between simplifying an expression and solving an equation.

8) How many terms does this expression have?

$$2xy^2 + 3x^2y - x^2 - xy^2 + 4x^2y - 9$$

9) Simplify the expression above.

Simplify the expression.

10) $5[7 + 7(4 + 7)]$

Evaluate the expression for the given values.

11) $(x + 3y)^2$ $x = 3, y = 3$

12) In your own words, explain how to combine like terms.

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Solve the problem by combining like terms.

- 13) The value of 8 dimes is $10 \cdot 8 = 80$ cents. Likewise, the value of x dimes is $10x$. If George finds $2x - 2$ nickels, $3x$ dimes, and x quarters in his change jar, express the total value of change in cents as an algebraic expression.
- A) $(65x - 10)$ cents B) $(65x + 10)$ cents C) $(65x - 2)$ cents D) $(40x - 10)$ cents

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

14) Explain the steps you use to solve linear equations. Use an example.

Solve the equation.

15) $\frac{4(7-x)}{3} = x$

16) $2(2z - 2) = 3(z + 4)$

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Solve the following equations.

17) $\frac{a}{3} - \frac{1}{3} = -5$

- A) $a = -14$
- B) All real numbers
- C) No solution
- D) $a = -42$
- E) $a = 14$

18) $4(x + 5) = (4x + 20)$

- A) All real numbers B) No solution C) $x = 10$ D) $x = 4$

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Write the sentence as an equation, using x for the unknown number. Then solve the equation.

19) Three-fourths of a number is $\frac{5}{6}$. Find the number in lowest terms.

20) When is there no solution to an equation?

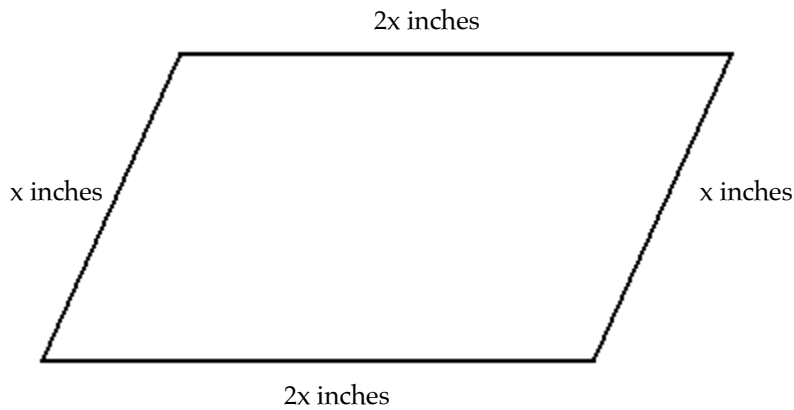
21) When is the answer to an equation "all real numbers?"

22) In class we discussed four steps to problem solving. Describe the steps in your own words.

Solve the problem.

23) An isosceles triangle contains two angles of the same measure. If the measure of the third angle is 36° less than the measure of either of the other two angles, find the measure of one of the identical angles. (Hint: The sum of the angles of a triangle is 180° .)

- 24) The perimeter of a figure is the sum of the lengths of its sides. If the perimeter of the following parallelogram is 12 inches, find the length of each side.



Solve the problem using a known formula.

- 25) Jim runs one time around a circular track that has a radius of 7 kilometers, and Chris runs two times around a circular track with a radius of 4 kilometers. Who ran the farther distance?

Formulas for circles:

$$A = \pi r^2$$

$$C = 2\pi r$$

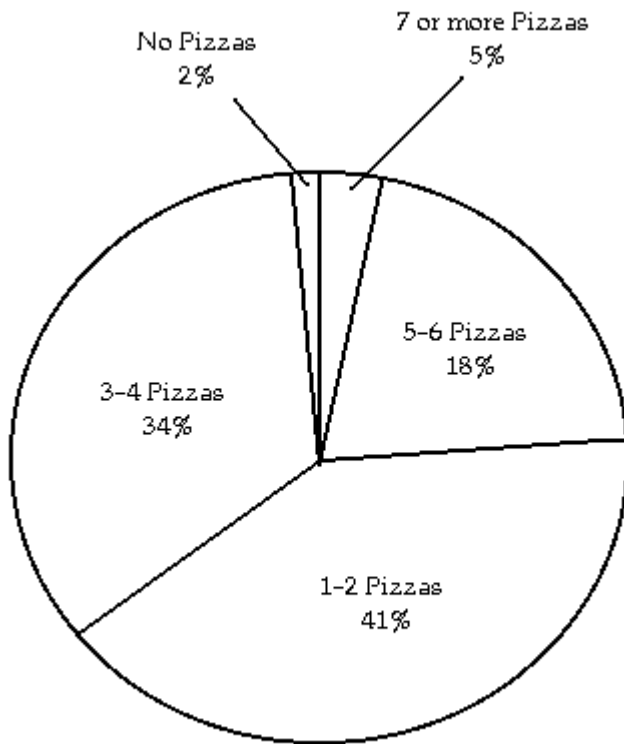
(Use 3.14 as an approximation for π .)

- 26) How long would it take to drive 280 kilometers if your average rate of speed was 40 kilometers per hour?

Solve the problem. (3 pts.)

- 27) 12% of students at a university attended a lecture. If 5000 students are enrolled at the university, about how many students attended the lecture?

The pie chart below shows the number of pizzas consumed by college students in a typical month. Use the chart to answer the question.



28) What percent of college students consume 3 or more pizzas in a typical month?

Solve the problem.

29) 12% of students at a university attended a lecture. If 5000 students are enrolled at the university, about how many students attended the lecture?

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Choose the set of ordered pairs that are all solutions to the equation.

30) $y + 4x = 8$

A) (1, 8), (8, 8), (0, 8)

B) (1, 4), (8, -24), (0, -24)

C) (1, 8), (8, -24), (0, -24)

D) (1, 4), (8, -24), (0, 8)

ESSAY. Write your answer in the space provided or on a separate sheet of paper.

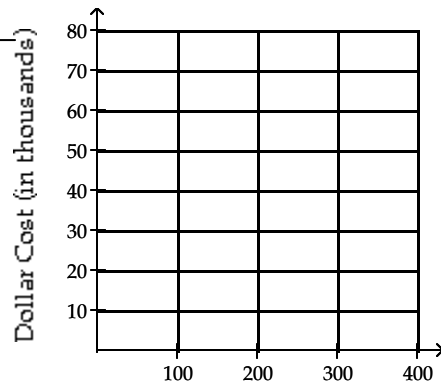
31) Explain why it is best to plot three points to graph a line when only two are needed.

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

32) The cost in dollars of manufacturing x mountain bikes is given by $y = 200x + 5000$.

a. Complete the following table and graph the results.

x	100	200	300
y	25,000		

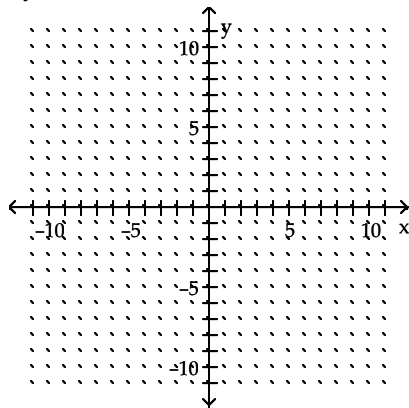


Number of mountain bikes manufactured

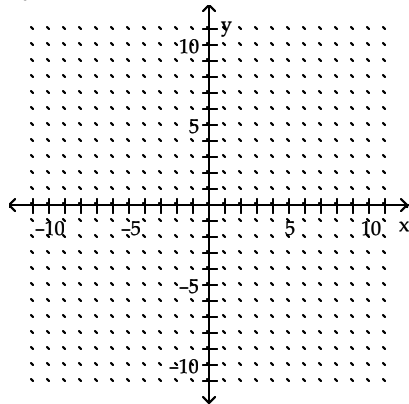
b. Find the number of mountain bikes that can be manufactured for \$47,200

Graph the linear equation.

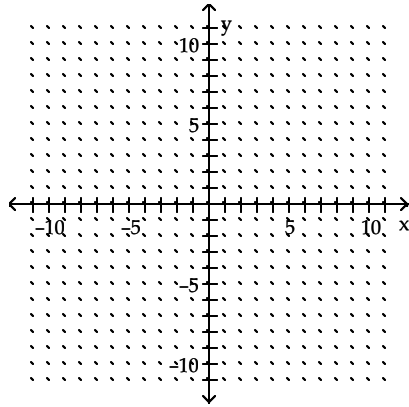
33) $3y - 9x = -15$



34) $9y = x - 2$

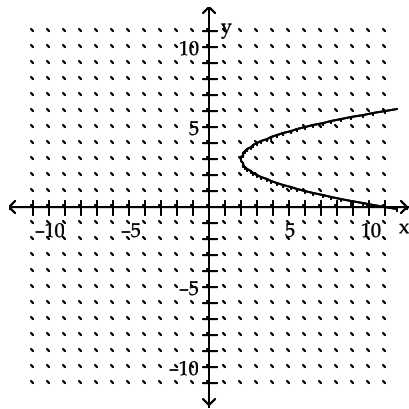


35) $4x + y = 0$



Explain the vertical line test and use it to determine whether or not the graph is a graph of a function.

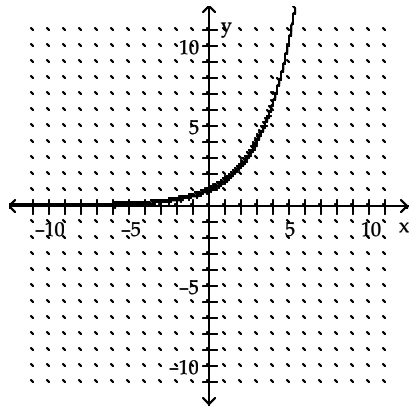
36)



MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Use the vertical line test to determine whether or not the graph is a graph of a function.

37)



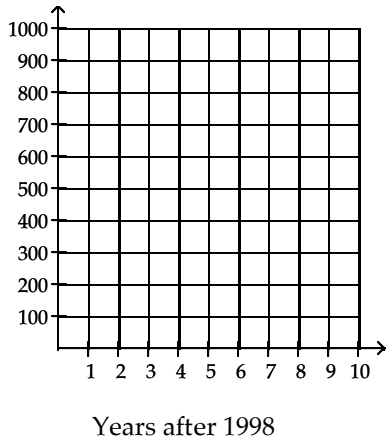
A) Function

B) Not a function

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Solve.

- 38) A small-business research project estimated that for the years 1998–2003, the total number of retail bicycle stores in a particular region would grow according to the linear equation $y = 20x + 300$, where x is the number of years after 1998. Graph the equation and use the graph to predict the total number of retail bicycle stores in 2008.



- 39) Define domain and range.
- 40) What is the domain of the function $f(x) = \frac{3}{x}$?

Given the function, find the indicated value.

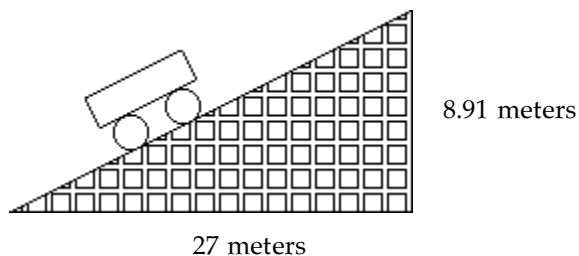
- 41) Find $f(3)$ when $f(x) = 2x^2 + 2x + 1$.

Find the slope of the line that goes through the given points.

- 42) $(-5, 15), (-3, -14)$
- 43) $(-1, -2), (1, 6)$

Solve.

- 44) A section of roller coaster track has the dimensions shown in the diagram. Find the grade of the track, which is the slope written as a percent.



- 45) Explain how to find the slope of a line when given an equation. Use an example.

Find the slope of the line.

- 46) $4y - 2x = -10$

47) $y = -2x$

48) $2x + 5y = 34$

49) If an equation is in the slope-intercept form, $y = mx + b$, what do m and b stand for?

Find the y-intercept.

50) $f(x) = -3x - 1$

51) $-8x + 9y = -2$

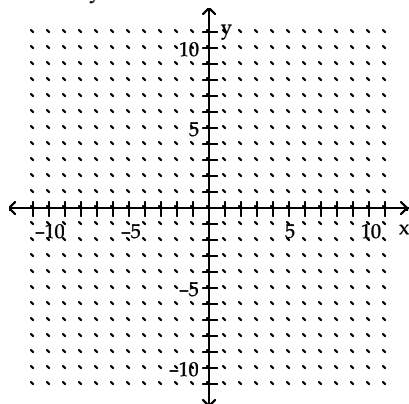
Use the slope-intercept form of the linear equation to write the equation of the line with the given slope and y-intercept.

52) Slope $\frac{4}{5}$; y-intercept -2

53) Explain the steps used to write a linear equation when given 2 points. Give an example.

Graph the linear function by finding x- and y-intercepts.

54) $5x - 10y = 20$



Find the slope of the line that goes through the given points.

55) $(-5, 15), (-3, -14)$

Find an equation of the line with the given slope and containing the given point. Write the equation in slope-intercept form.

56) Through the point $(7, -1)$ with a slope of 0

57) Through $(-2, 0)$ and $(3, 9)$

58) Through $(6, 10)$ and $(-4, -7)$

Solve.

59) The monthly cost of a certain long distance service is given by the linear function $C(t) = 0.05t + 3.95$ where $C(t)$ is in dollars and t is the amount of time in minutes called in a month. Find the cost of calling long distance for 160 minutes in a month.

60) The approach ramp used by a daredevil motorcyclist for flying over a collection of flaming tires has a rise of 15 feet for every 30 feet in horizontal distance. Find the grade of the ramp. Round to the nearest whole percent.

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Find the slope of the line.

61) $4y - 2x = -10$

A) $\frac{1}{2}$

B) $-\frac{1}{2}$

C) $-\frac{5}{2}$

D) -2

Find the y-intercept.

62) $-8x + 9y = -2$

A) -2

B) $\frac{8}{9}$

C) $-\frac{2}{9}$

D) no y-intercept

Determine whether the lines are parallel, perpendicular, or neither.

63) $3x - 2y = 19$

$2x + 3y = 18$

A) perpendicular

B) parallel

C) neither

64) $9x + 3y = 12$

$24x + 8y = 36$

A) parallel

B) neither

C) perpendicular

65) $f(x) = 4x + 3$

$g(x) = -4x - 5$

A) neither

B) parallel

C) perpendicular

Find the slope.

66) Find the slope of a line perpendicular to the line $f(x) = \frac{2}{5}x + 9$.

A) $\frac{2}{5}$

B) undefined

C) $-\frac{5}{2}$

D) 9

Use the slope-intercept form of the linear equation to write the equation of the line with the given slope and y-intercept.

67) Slope $\frac{1}{4}$; y-intercept 2

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

B) $y = -\frac{1}{4}x - 2$

C) $y = \frac{1}{4}x - 2$

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

68) Slope $-\frac{3}{4}$; y-intercept $\frac{44}{8}$

A) $y = \frac{6}{8}x + \frac{44}{8}$

B) $y = -\frac{6}{8}x + \frac{44}{8}$

C) $y = \frac{6}{8}x - \frac{44}{8}$

D) $y = -\frac{6}{8}x - \frac{44}{8}$

Interpret the linear equation.

- 69) When a tow truck is called, the cost of the service is given by the linear function $y = 3x + 75$, where y is in dollars and x is the number of miles the car is towed. Find and interpret the slope and y -intercept of the linear equation.
- A) $m = 75$; The cost of the service increases \$75 every mile the car is towed. $b = 3$; The cost of the service is \$3 if the car is not towed.
 - B) $m = 75$; The number of miles the car is towed increases 75 miles for every dollar spent on the service. $b = 3$; The tow truck will tow the car 3 miles for no cost.
 - C) $m = 3$; The cost of the service increases \$ a every mile the car is towed. $b = 75$; The cost of the service is \$75 if the car is not towed.
 - D) $m = 3$; The number of miles the car is towed increases 3 miles for every dollar spent on the service. $b = 75$; The tow truck will tow the car 75 miles for no cost.

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Model the problem with a linear equation.

- 70) An investment is worth \$3582 in 1994. By 1999 it has grown to \$5777. Let y be the value of the investment in the year x , where $x = 0$ represents 1994.

a) What is the slope of this line?

b) Write a linear equation that models the value of the investment in the year x .

c) What is the investment worth this year, 2002?

- 71) When making a telephone call using a calling card, a call lasting 4 minutes cost \$0.85. A call lasting 12 minutes cost \$1.65. Let y be the cost of making a call lasting x minutes using a calling card.

a) What is the slope of this line?

b) Write a linear equation that models the cost of a making a call lasting x minutes.

c) What is the cost of a 2 hour and 20 minute phone call on this card?

72) The average value of a certain type of automobile was \$15,000 in 1992 and depreciated to \$6420 in 1995. Let y be the average value of the automobile in the year x , where $x = 0$ represents 1992.

a) What is the slope of this line?

b) Write a linear equation that models the value of the automobile in terms of the year x .

c) When will this automobile be worthless? (*Hint: When is the value 0?*)

73) When making a telephone call using a calling card, a call lasting 4 minutes cost \$0.85. A call lasting 12 minutes cost \$1.65. Let y be the cost of making a call lasting x minutes using a calling card.

a) What is the slope of this line?

b) Write a linear equation that models the cost of a making a call lasting x minutes.

c) What is the cost of a 2 hour and 20 minute phone call on this card?

ESSAY. Write your answer in the space provided or on a separate sheet of paper.

74) Explain what purpose math has in your daily life and your career goals.

Answer Key

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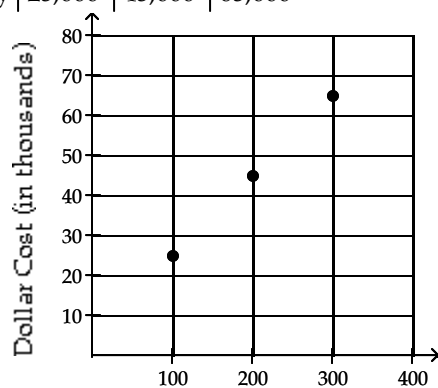
- 1) Answer: C
- 2) Answer: $19\frac{5}{7}$
- 3) Answer: $\frac{104}{105}$
- 4) Answer: $\frac{103}{165}$
- 5) Answer: $\frac{9}{13}$
- 6) Answer:
- 7) Answer:
- 8) Answer: 4
- 9) Answer:
- 10) Answer: 420
- 11) Answer: 144
- 12) Answer:
- 13) Answer: A
- 14) Answer:
- 15) Answer: $x = 4$
- 16) Answer: $z = 16$
- 17) Answer: A
- 18) Answer: A
- 19) Answer: $\frac{3}{4}x = \frac{5}{6}; \frac{10}{9}$
- 20) Answer:
- 21) Answer:
- 22) Answer:
- 23) Answer: 72°
- 24) Answer: $x = 2$ inches; $2x = 4$ inches
- 25) Answer: Chris ran a farther distance.
- 26) Answer: 7 hours
- 27) Answer: 600 students
- 28) Answer: 57%
- 29) Answer: 600 students
- 30) Answer: D
- 31) Answer:

Answer Key

Testname: MIDTERMMAKEUP.TST

32) Answer: a.

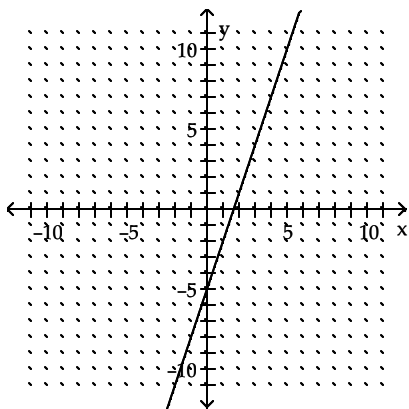
x	100	200	300
y	25,000	45,000	65,000



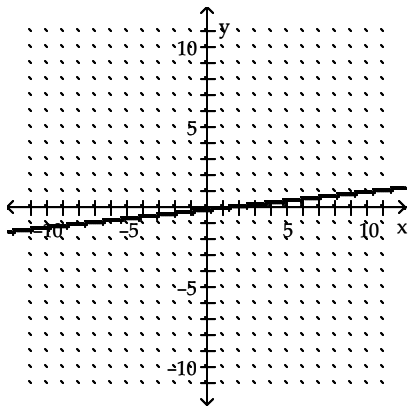
Number of mountain
bikes manufactured

b. The number of mountain bikes that can be manufactured for \$47,200 is 211.

33) Answer:



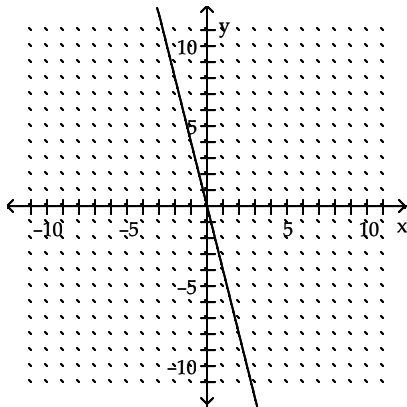
34) Answer:



Answer Key

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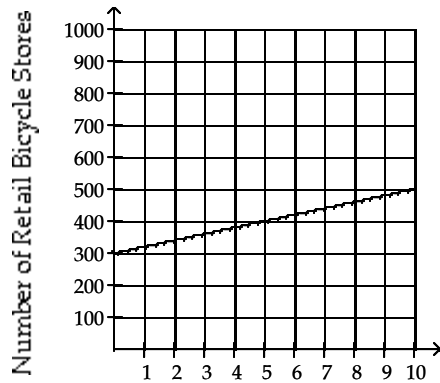
35) Answer:



36) Answer: Not a function

37) Answer: A

38) Answer: 500 stores



Years after 1998

39) Answer: Domain is what x can (or cannot) be and range is what y can (or cannot) be.

40) Answer: x cannot = 0

41) Answer: 25

42) Answer: $-\frac{29}{2}$

43) Answer: 4

44) Answer: 33%

45) Answer:

46) Answer: $\frac{1}{2}$

47) Answer: -2

48) Answer: $-\frac{2}{5}$

49) Answer: m is slope and b is the intercept

50) Answer: -1

51) Answer: $-\frac{2}{9}$

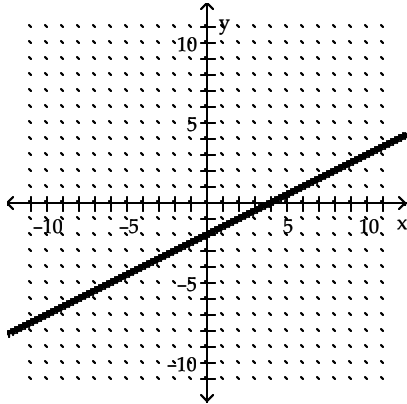
Answer Key

Testname: MIDTERMMAKEUP.TST

52) Answer: $y = \frac{4}{5}x - 2$

53) Answer:

54) Answer: (0, -2), (4, 0)



55) Answer: $-\frac{29}{2}$

56) Answer: $y = -1$

57) Answer: $9x - 5y = -18$

58) Answer: $-17x + 10y = -2$

59) Answer: \$11.95

60) Answer: 50%

61) Answer: A

62) Answer: C

63) Answer: A

64) Answer: A

65) Answer: A

66) Answer: C

67) Answer: A

68) Answer: B

69) Answer: C

70) Answer: a) 439

b) $y = 439x + 3582$

c) \$7094

71) Answer: a) 0.1

b) $y = 0.1x + 0.45$

c) \$8.45

72) Answer: a) -2860

b) $y = -2860x + 15,000$

c) 1998

73) Answer: a) 0.1

b) $y = 0.1x + 0.45$

c) \$8.45

74) Answer: