Intermediate Algebra
MAT 1033

Final Exam Review

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

Decide whether the relation is a function.

1) {(–5, –1), (–2, –9), (2, 1), (8, –9)} 1) _____

A) not a function B) function

Objective: (2.1) Determine Whether a Relation is a Function

2) {(–2, 1), (1, –5), (4, –8), (8, –8), (10, 4)} 2) _____

A) not a function B) function

Objective: (2.1) Determine Whether a Relation is a Function

Find the indicated function value.

3) Find $g(a + 1)$ when $g(x) = \frac{1}{4}x + 3$. 3) _____

A) $\frac{a + 13}{4}$ B) $\frac{a + 16}{4}$ C) $\frac{a + 25}{4}$ D) $\frac{a - 13}{4}$

Objective: (2.1) Evaluate a Function

4) Find $f(-1)$ when $f(x) = 3x^2 + 2x + 6$. 4) _____

A) 5 B) –5 C) 7 D) 11

Objective: (2.1) Evaluate a Function

Find the domain and range.

5) {(–4,6), (–8,–9), (–7,5), (–7,–6)} 5) _____

A) domain = {–8, –4, –7, 7}; range = {–9, 6, 5, –6}

B) domain = {–8, –4, –7}; range = {–9, 6, 5, –6}

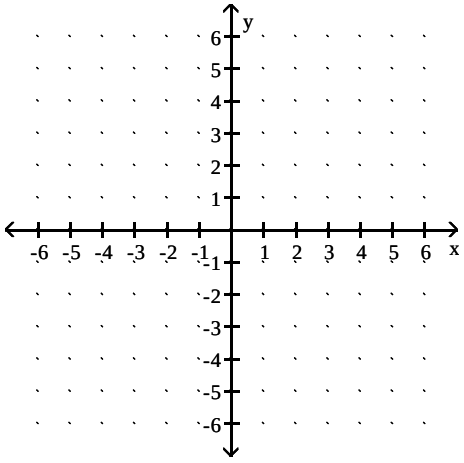
C) domain = {–8, –4, –7, –17}; range = {–9, 6, 5, –6}

D) domain = {–9, 6, 5, –6}; range = {–8, –4, –7}

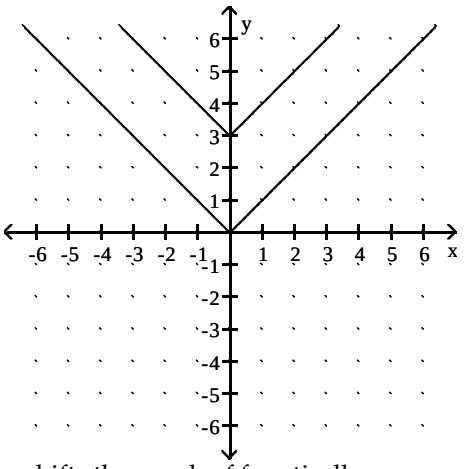
Objective: (2.1) Find the Domain and Range of a Relation

Graph the given functions on the same rectangular coordinate system. Describe how the graph of g is related to the graph of f.

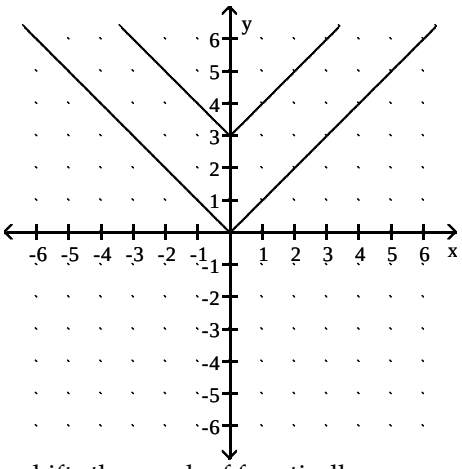
6) $f(x) = |x|$, $g(x) = |x| + 3$ 6) _____



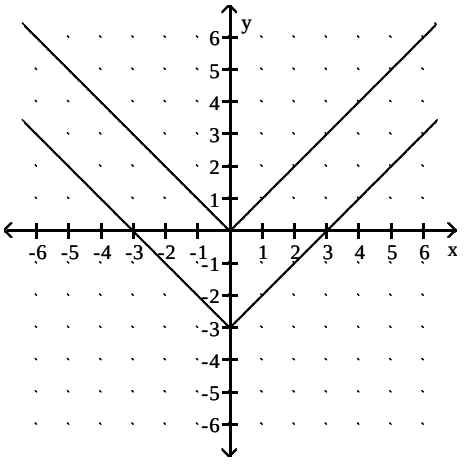
A) g shifts the graph of f vertically down 3 units



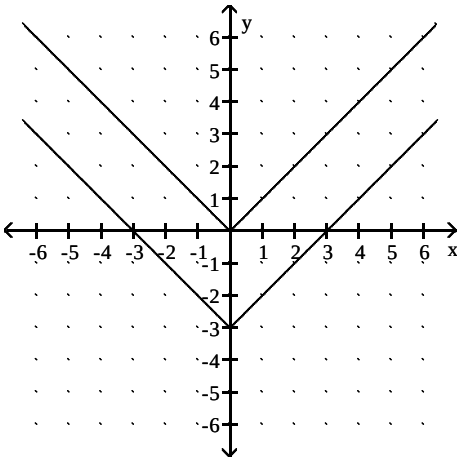
B) g shifts the graph of f vertically up 3 units



C) g shifts the graph of f vertically down 3 units

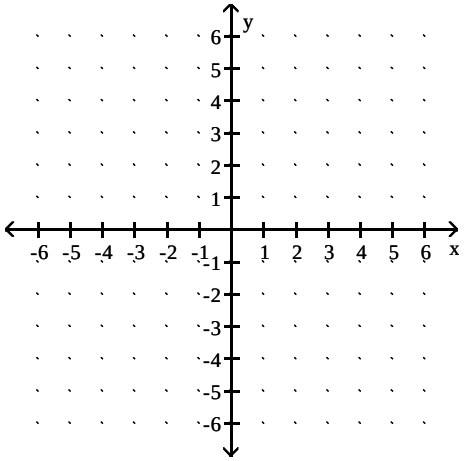


D) g shifts the graph of f vertically up 3 units

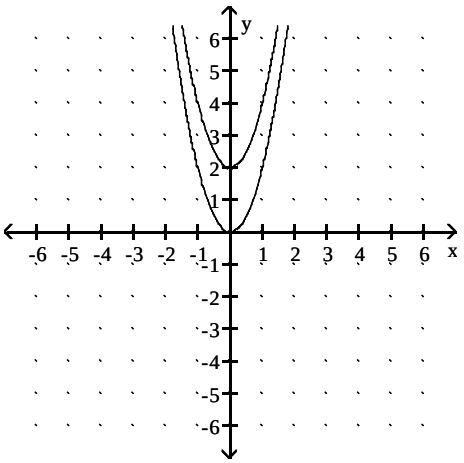


Objective: (2.2) Graph Functions by Plotting Points

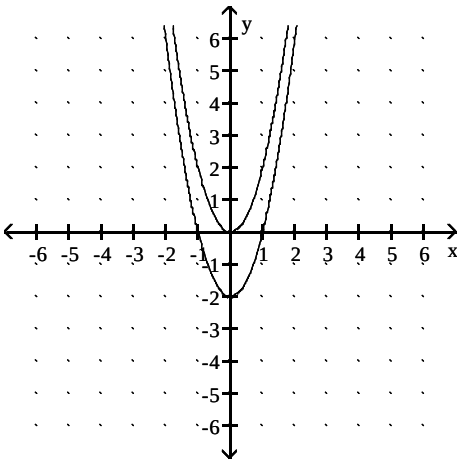
7) $f(x) = 2x^2$, $g(x) = 2x^2 - 2$ 7) _____



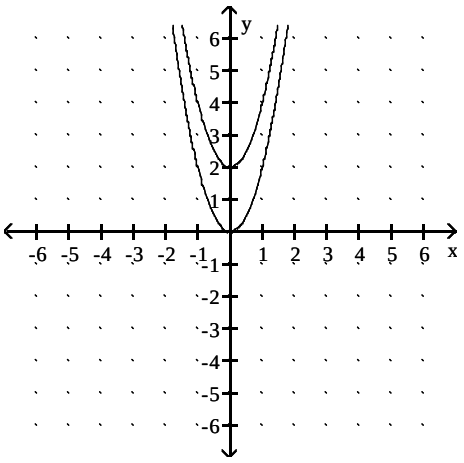
A) g shifts the graph of f vertically down 2 units



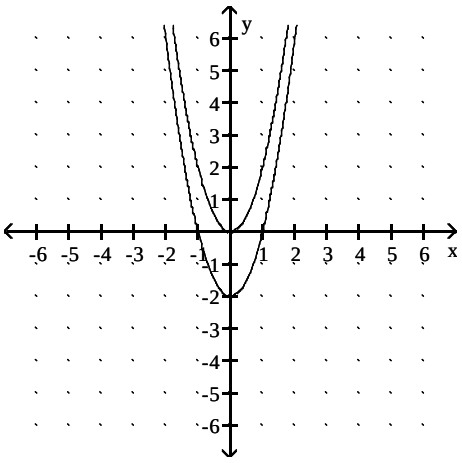
B) g shifts the graph of f vertically down 2 units



C) g shifts the graph of f vertically up 2 units



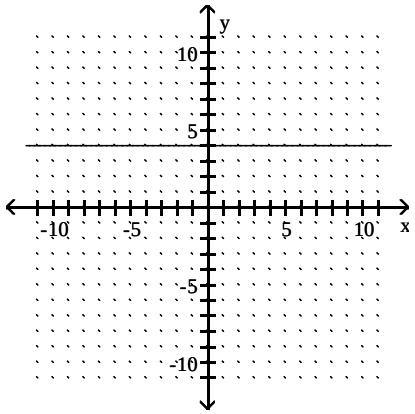
D) g shifts the graph of f vertically up 2 units



Objective: (2.2) Graph Functions by Plotting Points

Use the graph to identify domain and range.

8) 8) _____



A) domain: {4}
range: (0, ∞)

B) domain: (−∞, ∞)
range: {4}

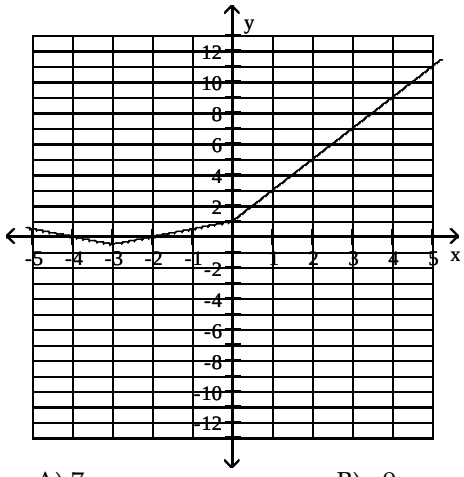
C) domain: {4}
range: (−∞, ∞)

D) domain: (0, ∞)
range: {4}

Objective: (2.2) Identify the Domain and Range of a Function from Its Graph

Use the graph to find the indicated function value.

9) y = f(x). Find f(4) 9) _____



A) 7

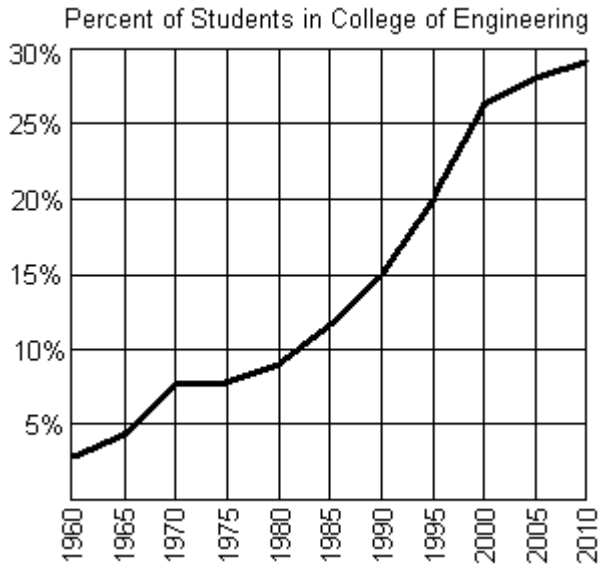
B) −9

C) 1.5

D) 9

Objective: (2.2) Obtain Information About a Function from Its Graph

The graph below shows the percentage of students enrolled in the College of Engineering at State University. Use the graph to answer the question.



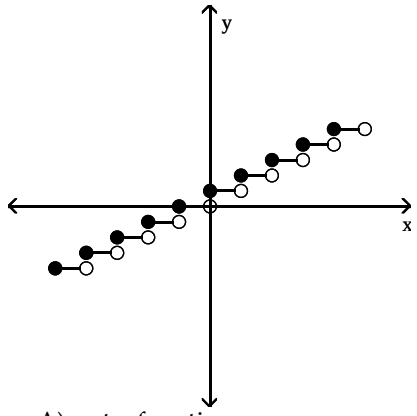
10) Does the graph represent a function? 10) _____

A) no B) yes

Objective: (2.2) Obtain Information About a Function from Its Graph

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

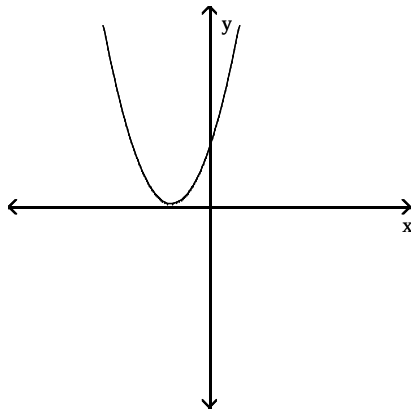
11) 11) _____



A) not a function B) function

Objective: (2.2) Use the Vertical Line Test to Identify Functions

12) 12) _____



A) not a function B) function

Objective: (2.2) Use the Vertical Line Test to Identify Functions

Find the domain of the function.

13) $f(x) = x^2 + 9$ 13) _____

A) $[-9, \infty)$ B) $(-\infty, -9)$ or $(-9, \infty)$

C) $(-\infty, \infty)$ D) $(-9, \infty)$

Objective: (2.3) Find the Domain of a Function

Solve the problem.

14) A firm making microwave ovens finds that the total cost, C(x), of producing x units is given by 14) _____

$C(x) = 70x + 790$.

The revenue, R(x), from selling x units is determined by the price per unit times the number of units sold, thus

$R(x) = 80x$.

Find and interpret $(R - C)(35)$.

A) \$6040 profit, income exceeds cost B) –\$440 loss, cost exceeds income

C) \$440 profit, income exceeds cost D) \$114 profit, income exceeds cost

Objective: (2.3) Use the Algebra of Functions to Combine Functions and Determine Domains

Find the indicated function value.

15) $f(x) = x + 5$, $g(x) = x - 6$ 15) _____

Find $(f + g)(1)$.

A) 1 B) –9 C) 3 D) 13

Objective: (2.3) Use the Algebra of Functions to Combine Functions and Determine Domains

16) $f(x) = 3x - 3$, $g(x) = 2x^2 - 1$ 16) _____

Find $(f + g)(5)$.

A) 63 B) 64 C) 51 D) 61

Objective: (2.3) Use the Algebra of Functions to Combine Functions and Determine Domains

17) $f(x) = 3x + 5$, $g(x) = 3x^2 + 5x - 3$ 17) _____

Find $(f + g)(4)$.

A) 68 B) 42 C) 82 D) 70

Objective: (2.3) Use the Algebra of Functions to Combine Functions and Determine Domains

Find the requested value.

18) $f(x) = -4x^2 - 2$, $g(x) = x + 7$ 18) _____

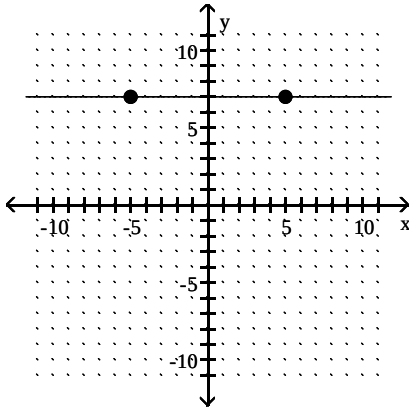
Find $f(4) - g(4)$.

A) 62 B) –77 C) –69 D) –63

Objective: (2.3) Use the Algebra of Functions to Combine Functions and Determine Domains

Find the slope of the line.

19) 19) _____



A) 0 B) 7 C) –5 D) undefined

Objective: (2.4) Compute a Line's Slope

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

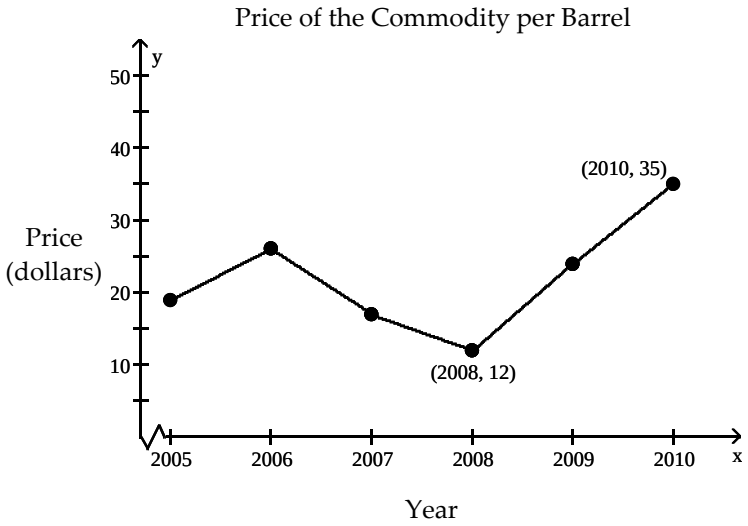
20) $(\frac{1}{4}, -4)$ and $(\frac{1}{4}, 3)$ 20) _____

A) Undefined B) $\frac{1}{28}$ C) 28 D) – 4

Objective: (2.4) Compute a Line's Slope

Solve the problem.

21) The price of a certain commodity is a function of supply and demand. The table below shows the price of the commodity per barrel between 2005 and 2010. Find the average annual rate of change between 2008 and 2010. 21) _____



A) $23.00 per year
B) $11.50 per year
C) $2.25 per year
D) –$11.50 per year

Objective: (2.4) Find a Function's Average Rate of Change

Find the slope and the y–intercept of the line.

22) $f(x) = \frac{1}{4}x$ 22) _____

A) $m = \frac{1}{4}$; $b = 0$
B) $m = 0$; $b = \frac{1}{4}$
C) $m = 4$; $b = 0$
D) $m = -\frac{1}{4}$; $b = 0$

Objective: (2.4) Find a Line's Slope and y–Intercept from its Equation

Rewrite the given equation in slope–intercept form by solving for y.

23) $-x + 7y = 63$ 23) _____

A) $y = 7x - 63$
B) $y = -x + 63$
C) $y = -\frac{1}{7}x + 9$
D) $y = \frac{1}{7}x + 9$

Objective: (2.4) Find a Line's Slope and y–Intercept from its Equation

Find the slope and the y–intercept of the line.

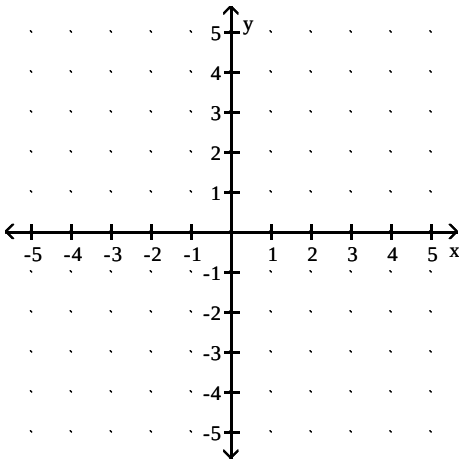
24) $y = 6x$ 24) _____

A) $m = \frac{1}{6}$; $b = 0$
B) $m = 0$; $b = 6$
C) $m = 6$; $b = 0$
D) $m = -6$; $b = 0$

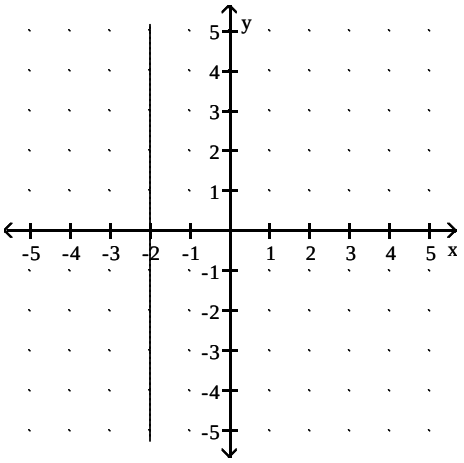
Objective: (2.4) Find a Line's Slope and y–Intercept from its Equation

Graph the equation in the rectangular coordinate system.

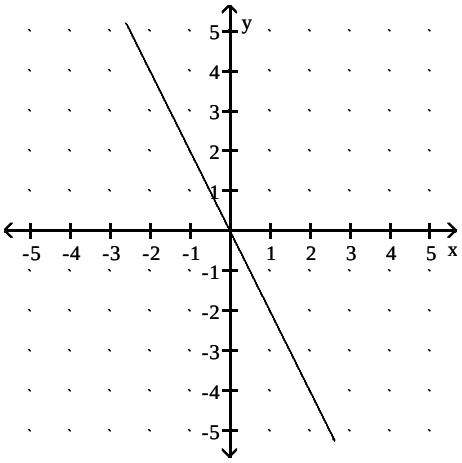
25) x = –2 25) _____



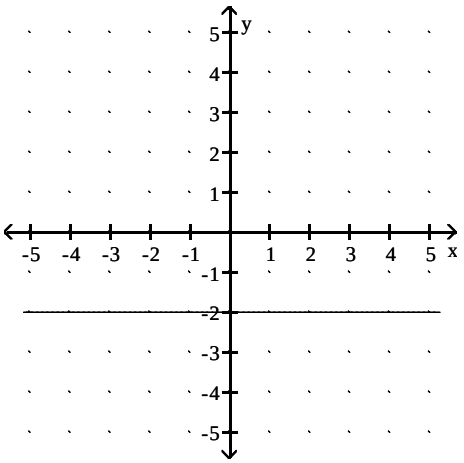
A)



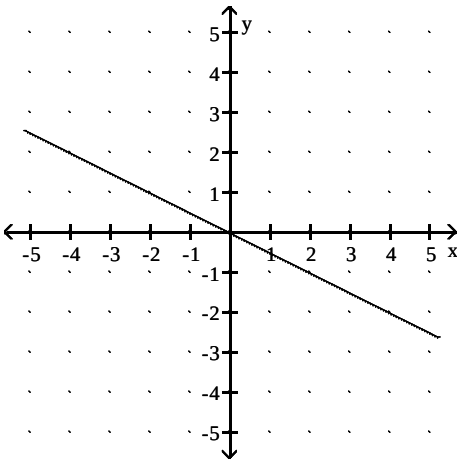
B)



C)



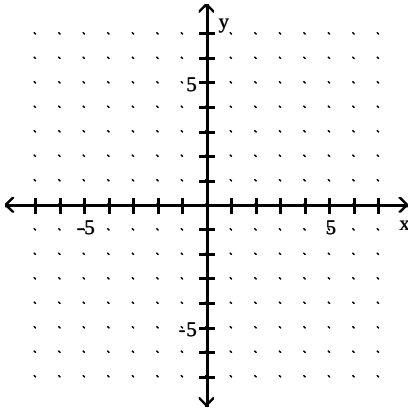
D)



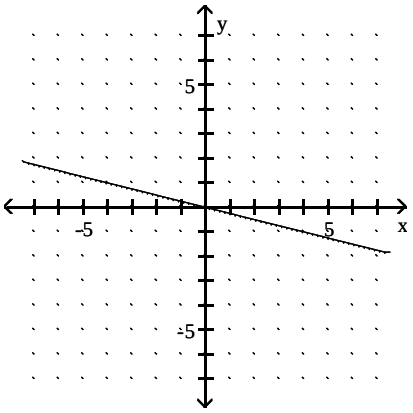
Objective: (2.4) Graph Horizontal or Vertical Lines

Use the slope and y–intercept to graph the linear function.

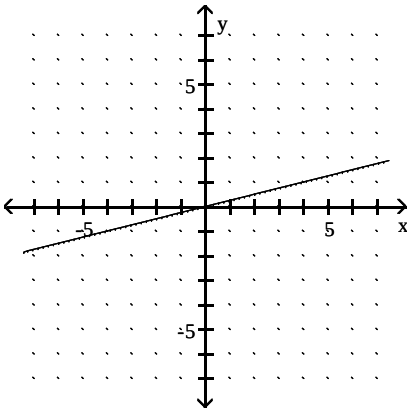
26) $y = -4x$ 26) _____



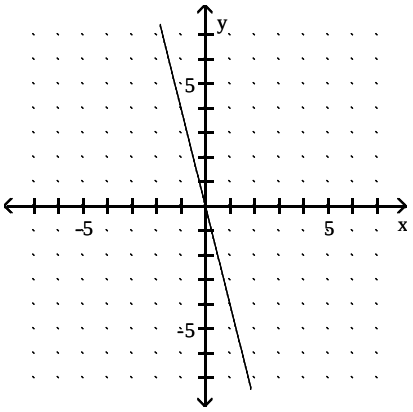
A)



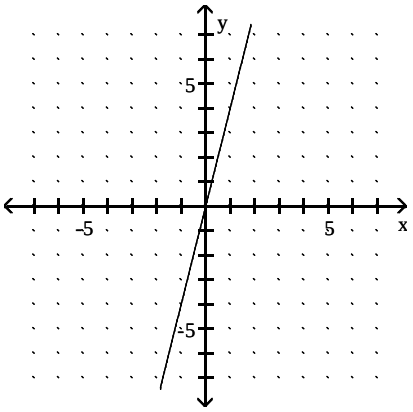
B)



C)

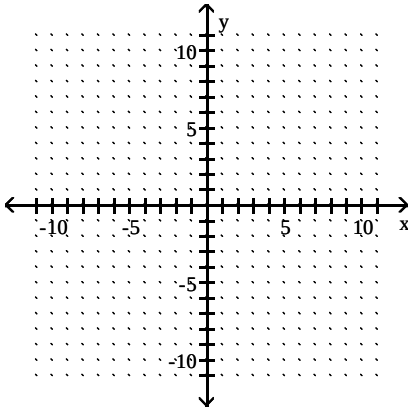


D)

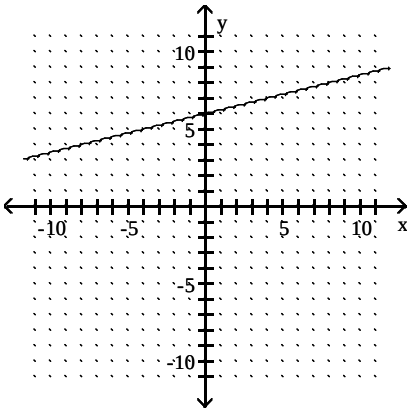


Objective: (2.4) Graph Linear Functions in Slope–Intercept Form

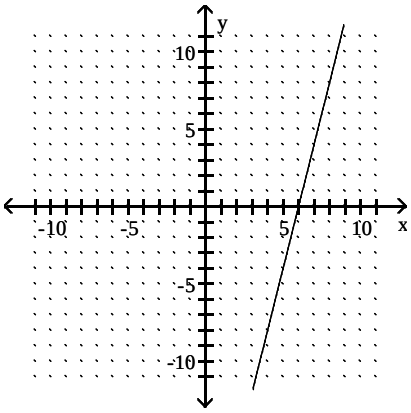
27) $-x + 4y = 24$ 27) _____



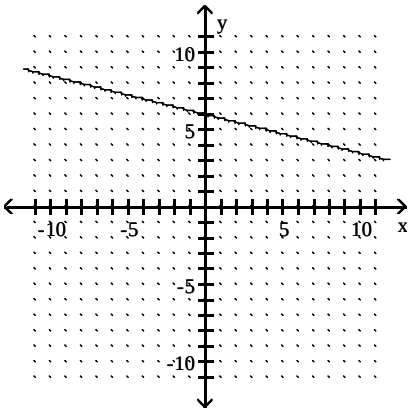
A)



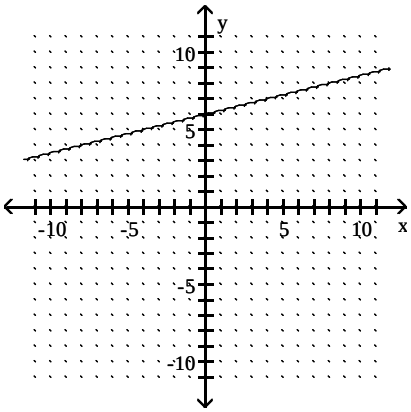
B)



C)



D)



Objective: (2.4) Graph Linear Functions in Slope–Intercept Form

Find the slope then describe what it means in terms of the rate of change of the dependent variable per unit change in the independent variable.

28) The linear function f(x) = 1.7x + 24 represents the percentage of people, f(x), who graduated from college x years after 1998. 28) _____

A) m = 1.7; the percentage of people graduating from college has increased at a rate of 1.7% per year after 1998.

B) m = 24; the percentage of people graduating from college has increased at a rate of 24% per year after 1998.

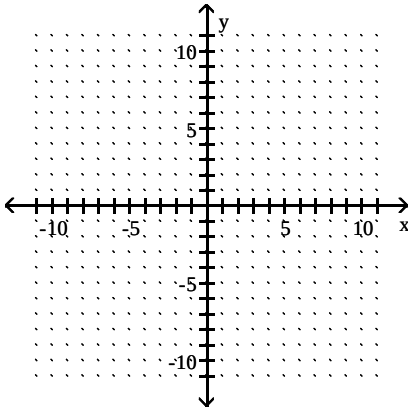
C) m = 1.7; the percentage of people graduating from college has decreased at a rate of 1.7% per year after 1998.

D) m = –1.7; the percentage of people graduating from college has decreased at a rate of 1.7% per year after 1998.

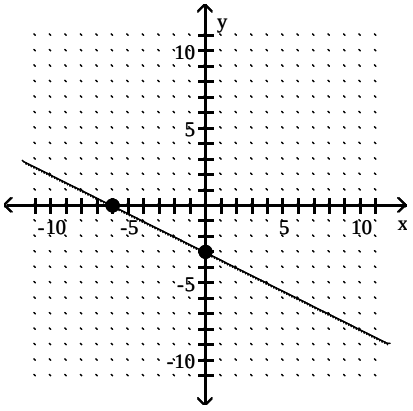
Objective: (2.4) Interpret Slope as a Rate of Change

Use intercepts and a checkpoint to graph the linear function.

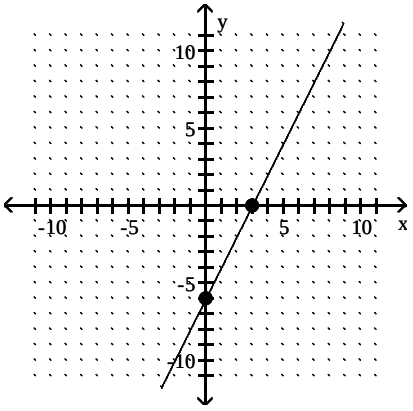
29) 5x – 10y = 30 29) _____



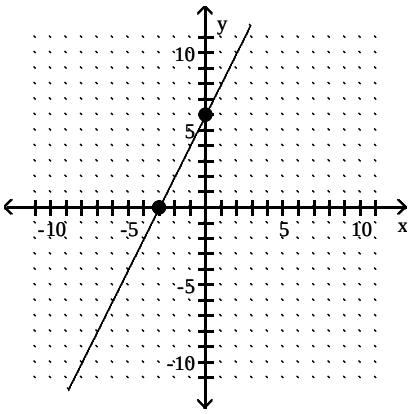
A) (0, –3), (–6, 0)



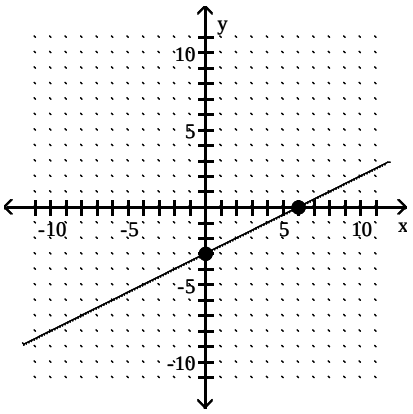
B) (0, –6), (3, 0)



C) (0, 6), (–3, 0)

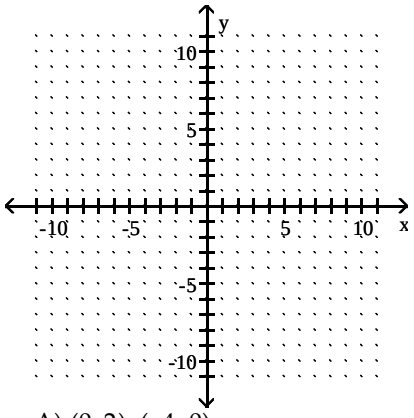


D) (0, –3), (6, 0)

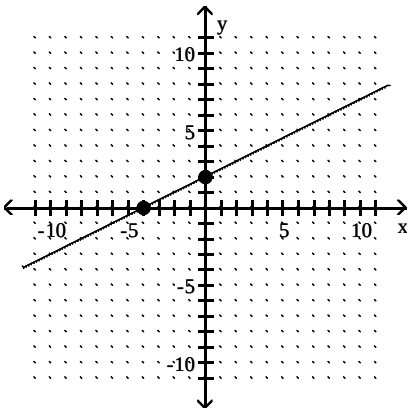


Objective: (2.4) Use Intercepts to Graph a Linear Function in Standard Form

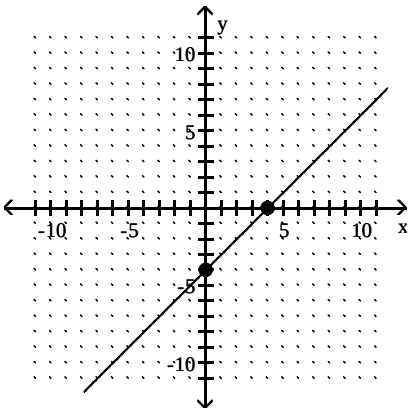
30) $y - \frac{1}{2}x = 2$ 30) _____



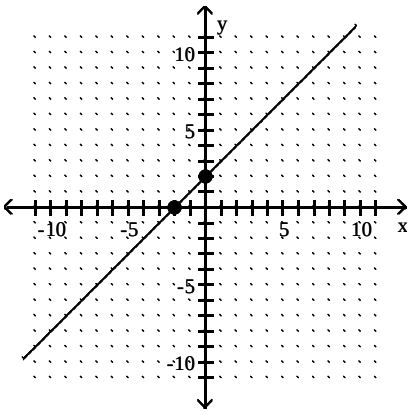
A) (0, 2), (–4, 0)



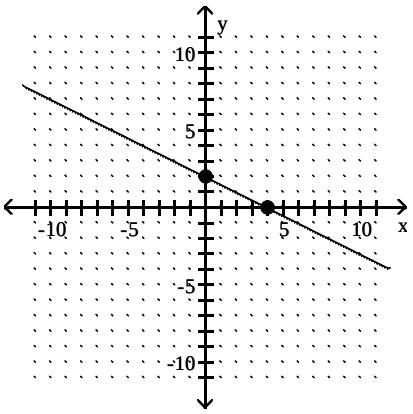
B) (0, –4), (4, 0)



C) (0, 2), (–2, 0)



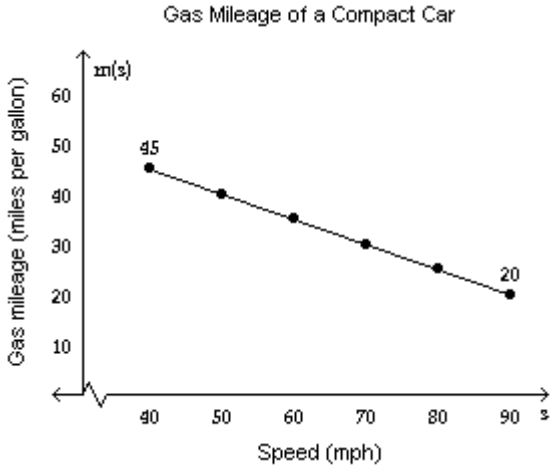
D) (0, 2), (4, 0)



Objective: (2.4) Use Intercepts to Graph a Linear Function in Standard Form

Solve the problem.

31) The gas mileage, m, of a compact car is a linear function of the speed, s, at which the car is driven, for $40 \le s \le 90$. For example, from the graph we see that the gas mileage for the compact car is 45 miles per gallon if the car is driven at a speed of 40 mph. 31) _____



i) Using the two points on the graph, determine the function m(s) that can be used to approximate the graph.
ii) Using the function from part i, estimate the gas mileage if the compact car is traveling 78 mph. If necessary, round to the nearest tenth.
iii) Using the function from part i, estimate the speed of the compact car if the gas mileage is 36 miles per gallon. If necessary, round to the nearest tenth.

A) i) $m(s) = \frac{1}{2}s + 65$

ii) 104 miles per gallon
iii) 58 mph

B) i) $m(s) = -\frac{1}{2}s + 65$

ii) 104 miles per gallon
iii) 58 mph

C) i) $m(s) = -\frac{1}{2}s + 65$

ii) 26 miles per gallon
iii) 63 mph

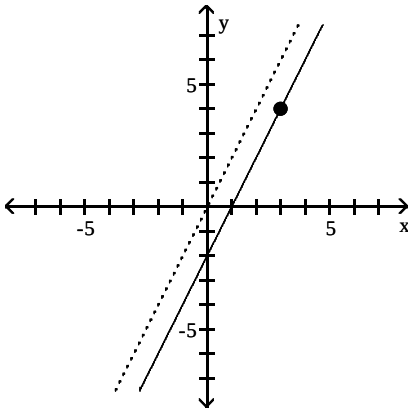
D) i) $m(s) = -\frac{1}{2}s + 65$

ii) 26 miles per gallon
iii) 58 mph

Objective: (2.4) Use Slope and y–Intercept to Model Data

Find an equation for the line with the given properties.

32) The solid line L contains the point (3, 4) and is parallel to the dotted line whose equation is $y = 2x$. Give the equation for the line L in slope–intercept form. 32) _____



A) $y = 2x + b$ B) $y = 2x - 2$ C) $y - 4 = 2(x - 3)$ D) $y = 2x + 1$

Objective: (2.5) Find Slopes and Equations of Parallel and Perpendicular Lines

Use the given conditions to write an equation for the line in slope–intercept form.

33) Passing through (5, –5) and parallel to the line whose equation is $y = -5x + 6$. 33) _____

A) $y = -\frac{1}{5}x - 4$ B) $y = -5x - 20$ C) $y = 5x - 20$ D) $y = -5x + 20$

Objective: (2.5) Find Slopes and Equations of Parallel and Perpendicular Lines

Find the slope.

34) Find the slope of a line parallel to the line $y = -1$. 34) _____

A) –1 B) – 1 C) 0 D) undefined

Objective: (2.5) Find Slopes and Equations of Parallel and Perpendicular Lines

Use the given conditions to write an equation for the line in slope–intercept form.

35) Passing through (4, 3) and perpendicular to the line whose equation is $y = 9x$. 35) _____

A) $y = -\frac{1}{9}x - \frac{31}{9}$ B) $y = \frac{1}{9}x - \frac{31}{9}$ C) $y = -9x - 31$ D) $y = -\frac{1}{9}x + \frac{31}{9}$

Objective: (2.5) Find Slopes and Equations of Parallel and Perpendicular Lines

Solve.

36) A vendor has learned that, by pricing hot dogs at $1.75, sales will reach 128 hot dogs per day. Raising the price to $2.50 will cause the sales to fall to 98 hot dogs per day. Let y be the number of hot dogs the vendor sells at x dollars each. Write a linear equation that models the number of hot dogs sold per day when the price is x dollars each. 36) _____

A) $y = -\frac{1}{40}x + \frac{20473}{160}$ B) $y = 40x + 58$

C) $y = -40x + 198$ D) $y = -40x - 198$

Objective: (2.5) Model Data with Linear Functions and Make Predictions

Write the point–slope form of the line satisfying the conditions. Then use the point–slope form of the equation to write the slope–intercept form of the equation in function notation.

37) Slope $= \frac{2}{7}$, passing through (0, 2) 37) _____

A) $f(x) = \frac{7}{2}x + 7$ B) $f(x) = \frac{2}{7}x + 2$ C) $f(x) = \frac{2}{7}x - 2$ D) $f(x) = -\frac{2}{7}x - 2$

Objective: (2.5) Use the Point–Slope Form to Write Equations of a Line

38) Passing through (2, –24) and (–1, 3) 38) _____

A) $f(x) = -\frac{1}{9}x - \frac{214}{9}$ B) $f(x) = 9x - 42$

C) $f(x) = \frac{1}{9}x - \frac{218}{9}$ D) $f(x) = -9x - 6$

Objective: (2.5) Use the Point–Slope Form to Write Equations of a Line

Determine whether the given ordered pair is a solution to the system.

39) (1, –2) 39) _____

$$\begin{cases} 3x + y = 1 \\ 2x + 3y = -4 \end{cases}$$

A) solution B) not a solution

Objective: (3.1) Determine Whether an Ordered Pair is a Solution of a System of Linear Equations

Determine whether the system has exactly one ordered–pair solution, no solution, or infinitely many solutions.

40) $\begin{cases} 3x - 2y = 1 \\ 6x - 4y = 3 \end{cases}$ 40) _____

A) one ordered–pair solution

B) no solution

C) infinitely many solutions

Objective: (3.1) Identify Systems That Do Not Have Exactly One Ordered–Pair Solution

Solve the system by any method.

41) $\begin{cases} \frac{1}{2}x + \frac{1}{2}y = 1 \\ \frac{1}{2}x - \frac{1}{2}y = 4 \end{cases}$ 41) _____

A) $\varnothing$ B) (–5, –2) C) (5, –3) D) (4, –2)

Objective: (3.1) Select the Most Efficient Method for Solving a System of Linear Equations

42) $\begin{cases} 8x - 2y = 6 \\ -16x + 4y = -18 \end{cases}$ 42) _____

A) (2, 3) B) (8, 6) C) $\varnothing$ D) $\left(\frac{2}{3}, -\frac{1}{6}\right)$

Objective: (3.1) Select the Most Efficient Method for Solving a System of Linear Equations

Solve the system by the addition method.

43) $\begin{cases} 4x + 8y = 40 \\ 4x + 2y = 58 \end{cases}$ 43) _____

A) {(16, –3)} B) {(–16, 4)}

C) {(x, y) | 4x + 2y = 58} D) ∅

Objective: (3.1) Solve Systems of Linear Equations by Addition

44) $\begin{cases} 9x + 24y = 24 \\ 6x - 8y = -8 \end{cases}$ 44) _____

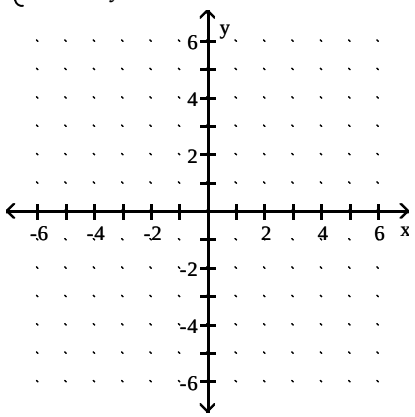
A) {(0, 1)} B) ∅

C) {(x, y) | 6x – 8y = –8} D) {(1, 0)}

Objective: (3.1) Solve Systems of Linear Equations by Addition

Solve the system by graphing.

45) $\begin{cases} 4x + y = 18 \\ 16x + 4y = 72 \end{cases}$ 45) _____

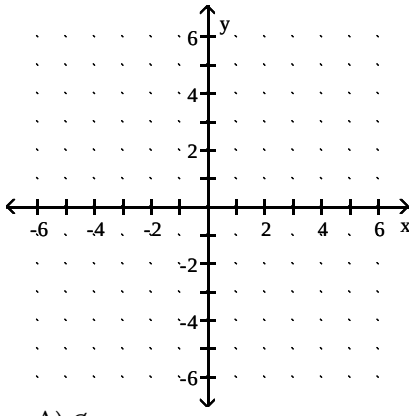


A) {(5, –2)} B) {(0, 18)}

C) {(x, y) | 4x + y = 18} D) ∅

Objective: (3.1) Solve Systems of Linear Equations by Graphing

46) $\begin{cases} 7x + y = 20 \\ 7x + y = 55 \end{cases}$ 46) _____



A) ∅ B) {(x, y) | 7x + y = 20}

C) {(14, 6)} D) {(12, 13)}

Objective: (3.1) Solve Systems of Linear Equations by Graphing

Solve the system by the substitution method.

47) $\begin{cases} x = -9y + 9 \\ 8x - 5y = -5 \end{cases}$ 47) _____

A) {(1, 0)} B) {(0, 1)}

C) ∅ D) {(x, y) | x = −9y + 9}

Objective: (3.1) Solve Systems of Linear Equations by Substitution

48) $\begin{cases} 5x - 2y = -1 \\ x + 4y = 35 \end{cases}$ 48) _____

A) {(3, 8)} B) ∅

C) {(x, y) | x + 4y = 35} D) {(3, 9)}

Objective: (3.1) Solve Systems of Linear Equations by Substitution

Solve the problem.

49) A flat rectangular piece of aluminum has a perimeter of 58 inches. The length is 7 inches longer than the width. Find the width. 49) _____

A) 18 in. B) 29 in. C) 11 in. D) 25 in.

Objective: (3.2) Solve Problems Using Systems of Equations

50) A college student earned $5000 during summer vacation working as a waiter in a popular restaurant. The student invested part of the money at 7% and the rest at 6%. If the student received a total of $323 in interest at the end of the year, how much was invested at 7%? 50) _____

A) $2500 B) $2700 C) $833 D) $2300

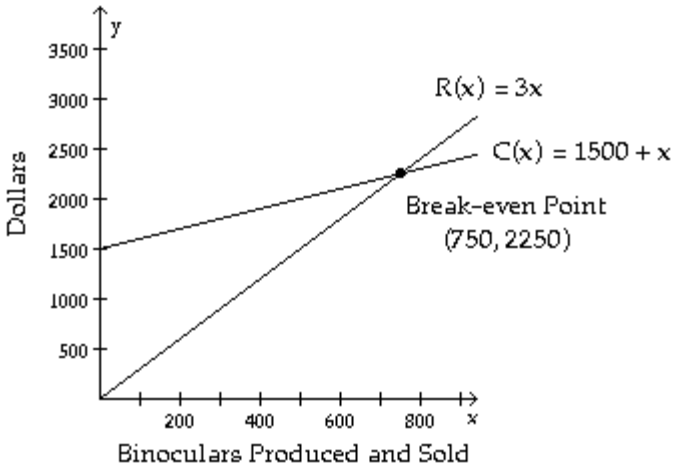
Objective: (3.2) Solve Problems Using Systems of Equations

51) Sybil is having her yard landscaped. She obtained an estimate from two landscaping companies. Company A gave an estimate of $180 for materials and equipment rental plus $60 per hour for labor. Company B gave an estimate of $240 for materials and equipment rental plus $50 per hour for labor. Create a cost equation for each company where y is the total cost of the landscaping and x is the number of hours of labor. Determine how many hours of labor will be required for the two companies to cost the same. 51) _____

A) 9 hr B) 6 hr C) 10 hr D) 5 hr

Objective: (3.2) Solve Problems Using Systems of Equations

The figure shows the graphs of the cost and revenue functions for a company that manufactures and sells binoculars. Use the information in the figure to answer the question.



52) What is the profit when 823 binoculars are produced? 52) _____

A) $1792 B) $146 C) $3146 D) $4792

Objective: (3.2) Use Functions to Model Revenue, Cost, and Profit, and Perform a Break-Even Analysis

53) Is there a profit when 893 binoculars are produced? 53) _____

A) Yes B) No

Objective: (3.2) Use Functions to Model Revenue, Cost, and Profit, and Perform a Break-Even Analysis

54) Fewer than how many binoculars must be produced and sold for the company to have a profit loss? 54) _____

A) 1500 binoculars B) 2250 binoculars C) 2700 binoculars D) 750 binoculars

Objective: (3.2) Use Functions to Model Revenue, Cost, and Profit, and Perform a Break-Even Analysis

Solve the problem.

55) Given the cost function, C(x), and the revenue function, R(x), write the profit function from producing and selling x units of the product. 55) _____

$C(x) = 0.4x + 810$

$R(x) = 1.3x$

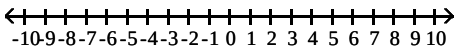
A) $P(x) = -0.9x + 810$ B) $P(x) = 0.9x + 810$

C) $P(x) = 0.9x - 810$ D) $P(x) = -0.9x - 810$

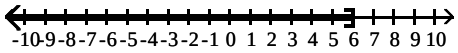
Objective: (3.2) Use Functions to Model Revenue, Cost, and Profit, and Perform a Break-Even Analysis

Solve the linear inequality. Other than ∅, graph the solution set on a number line.

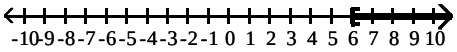
56) $7(x + 7) \geq 6(x - 6) + x$ 56) _____



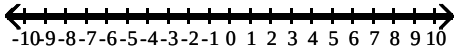
A) $(-\infty, 6]$



B) $[6, \infty)$



C) $(-\infty, \infty)$



D) ∅

Objective: (4.1) Recognize Inequalities with No Solution or All Real Numbers as Solutions

Solve.

57) A certain store has a fax machine available for use by its customers. The store charges $2.15 to send the first page and $0.65 for each subsequent page. Use an inequality to find the number of pages that can be faxed for $6.70. 57) _____

A) 10 pages or fewer
B) 3 pages or fewer
C) 8 pages or fewer
D) 50 pages or fewer

Objective: (4.1) Solve Applied Problems Using Linear Inequalities

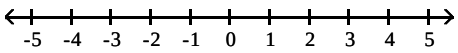
58) Every Sunday, Jarod buys a loaf of fresh bread for his family from the corner bakery for $4.00. The local department store has a sale on breadmakers for $71. If the bread-making supplies cost $0.67 per week, for how many weeks would Jarod have to bake a loaf of bread at home before the breadmaker starts saving him money? 58) _____

A) At least 22 weeks
B) At least 24 weeks
C) At least 23 weeks
D) At least 21 weeks

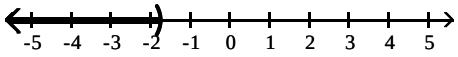
Objective: (4.1) Solve Applied Problems Using Linear Inequalities

Solve the inequality. Other than ∅, graph the solution set on a number line.

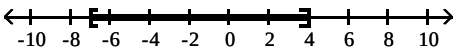
59) $8x - 7 \leq 4x - 14$ 59) _____



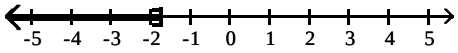
A) $\left(-\infty, -\frac{7}{4}\right)$



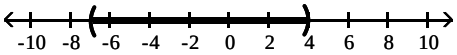
B) $[-7, 4]$



C) $\left(-\infty, -\frac{7}{4}\right]$

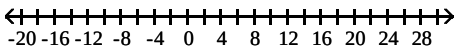


D) $(-7, 4)$

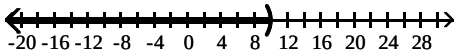


Objective: (4.1) Solve Linear Inequalities

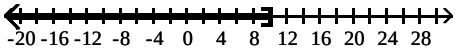
60) $\frac{x-5}{12} \geq \frac{x-4}{15} + \frac{1}{60}$ 60) _____



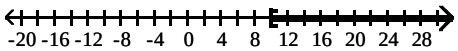
A) $(-\infty, 10)$



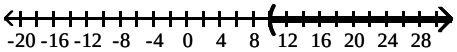
B) $(-\infty, 10]$



C) $[10, \infty)$



D) $(10, \infty)$



Objective: (4.1) Solve Linear Inequalities

Find the intersection of the sets.

61) $\{-6, -2, 2, 7\} \cap \{-4, 0, 5, 8\}$ 61) _____

A) $\{0\}$ B) $\{-2, 0, 2\}$

C) $\{-6, -4, -2, 0, 2, 5, 7, 8\}$ D) $\emptyset$

Objective: (4.2) Find the Intersection of Two Sets

Find the union of the sets.

62) $\{-4, -1, 3, 6\} \cup \{3, 6, 7\}$ 62) _____

A) $\{3, 6, 7\}$ B) $\{3, 6\}$ C) $\{-4, -1, 3, 6\}$ D) $\{-4, -1, 3, 6, 7\}$

Objective: (4.2) Find the Union of Two Sets

Solve. Use interval notation to express the range.

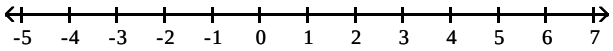
63) On the first four exams, your grades are 77, 89, 64, and 78. There is still a final exam, and it counts as two grades. You are hoping to earn a C in the course. This will occur if the average of your six exam grades is greater than or equal to 70 and less than 80. What range of grades on the final exam will result in earning a C? 63) _____

A) [42, 92) B) [56, 86) C) [56, 86] D) [42, 92]

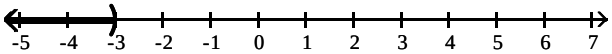
Objective: (4.2) Solve Compound Inequalities Involving "and"

Solve the compound inequality and graph the solution set on a number line. Except for the empty set, express the solution set in interval notation.

64) $x + 4 < 1$ and $-4x < 4$ 64) _____

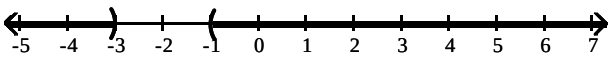


A) $(-\infty, -3)$

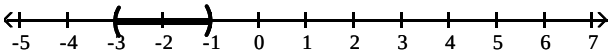


B) $\emptyset$

C) $(-\infty, -3) \cup (-1, \infty)$



D) $(-3, -1)$



Objective: (4.2) Solve Compound Inequalities Involving "and"

Solve. Use interval notation to express the range.

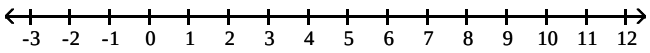
65) On the first four exams, your grades are 79, 87, 70, and 80. You are hoping to earn a C in the course. This will occur if the average of your five exam grades is greater than or equal to 70 and less than 80. What range of grades on the fifth exam will result in earning a C? 65) _____

A) [34, 84) B) (34, 84] C) (24, 74] D) [24, 74)

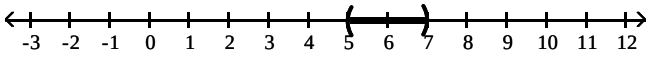
Objective: (4.2) Solve Compound Inequalities Involving "and"

Solve the compound inequality and graph the solution set on a number line. Except for the empty set, express the solution set in interval notation.

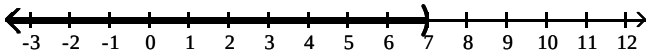
66) $x < 5$ or $x < 7$ 66) _____



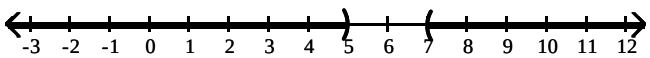
A) (5, 7)



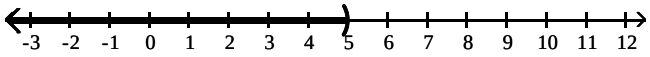
B) $(-\infty, 7)$



C) $(-\infty, 5) \cup (7, \infty)$



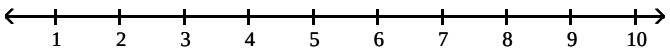
D) $(-\infty, 5)$



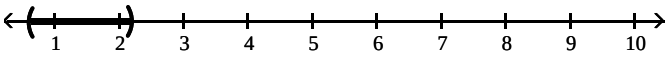
Objective: (4.2) Solve Compound Inequalities Involving "or"

Solve and graph the solution set on a number line. Express the solution set in both set –builder and interval notations.

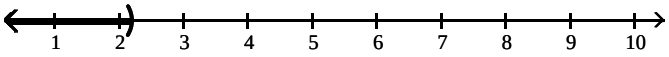
67) $|5x - 7| - 6 < -10$ 67) _____



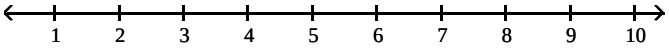
A) $\left(\frac{3}{5}, \frac{11}{5}\right)$



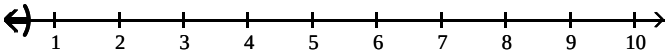
B) $\left(-\infty, \frac{11}{5}\right)$



C) $\emptyset$



D) $\left(-\infty, \frac{3}{5}\right)$



Objective: (4.3) Recognize Absolute Value Inequalities with No Solution or All Real Numbers as Solutions

Find the solution set for the equation.

68) $|x + 7| = 7$ 68) _____

A) $\emptyset$ B) $\{-14, 0\}$ C) $\{14, 0\}$ D) $\{0\}$

Objective: (4.3) Solve Absolute Value Equations

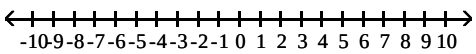
69) $|x - 8| = |9 - x|$ 69) _____

A) $\left\{\frac{1}{2}\right\}$ B) $\{17\}$ C) $\emptyset$ D) $\left\{\frac{17}{2}\right\}$

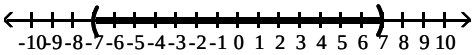
Objective: (4.3) Solve Absolute Value Equations

Solve and graph the solution set on a number line.

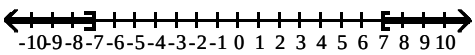
70) $|x| < 7$ 70) _____



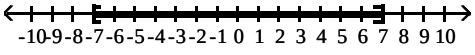
A) $(-7, 7)$



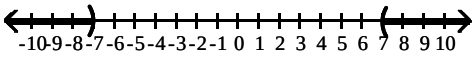
B) $(-\infty, -7] \cup [7, \infty)$



C) $[-7, 7]$

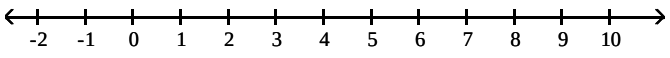


D) $(-\infty, -7) \cup (7, \infty)$

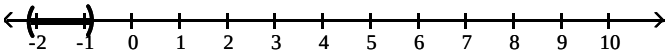


Objective: (4.3) Solve Absolute Value Inequalities of the Form $|u| < c$

71) $|6x + 9| - 4 > 0$ 71) _____

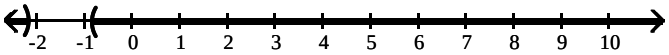


A) $\left(-\frac{5}{6}, -\frac{13}{6}\right)$

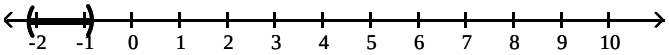


B) $\emptyset$

C) $\left(-\infty, -\frac{13}{6}\right] \cup \left(-\frac{5}{6}, \infty\right)$



D) $\left(-\frac{13}{6}, -\frac{5}{6}\right)$



Objective: (4.3) Solve Absolute Value Inequalities of the Form $|u| > c$

Solve.

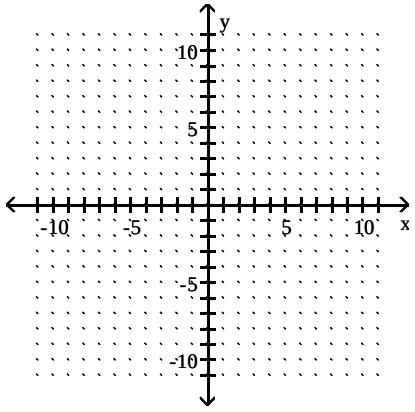
72) Chi is assigned to construct a triangle with the measure b of the base and the measure h of the height differing by no more than 0.2 centimeters. Express the relationship between b and h as an inequality involving absolute value. 72) _____

A) $|b + h| \geq 0.2$ B) $|b - h| < 0.2$ C) $|b - h| \leq 0.2$ D) $|h - b| > 0.2$

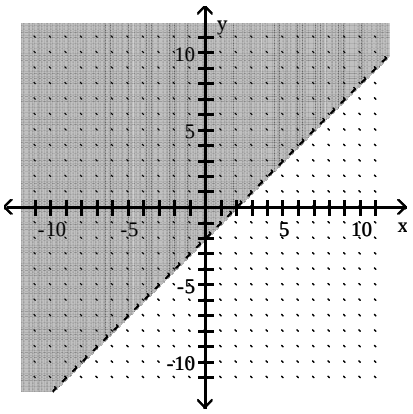
Objective: (4.3) Solve Problems Using Absolute Value Inequalities

Graph the inequality.

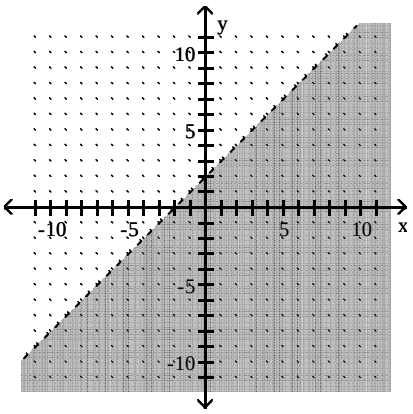
73) $y > x + 2$ 73) _____



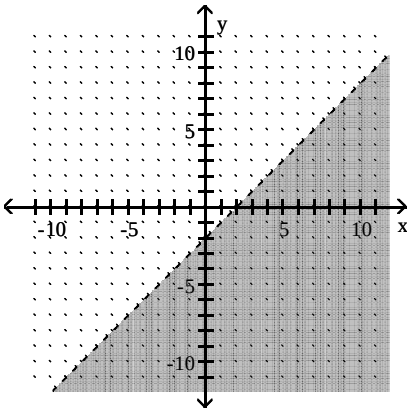
A)



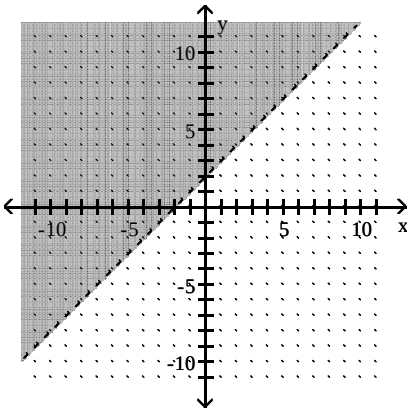
B)



C)

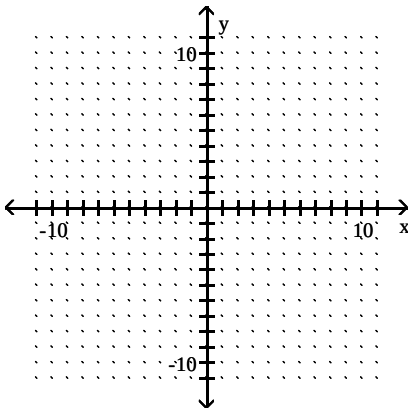


D)

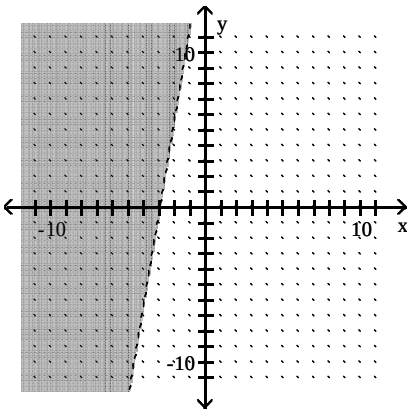


Objective: (4.4) Graph a Linear Inequality in Two Variables

74) $\frac{x}{3} + \frac{y}{2} > 1$ 74) _____



A)



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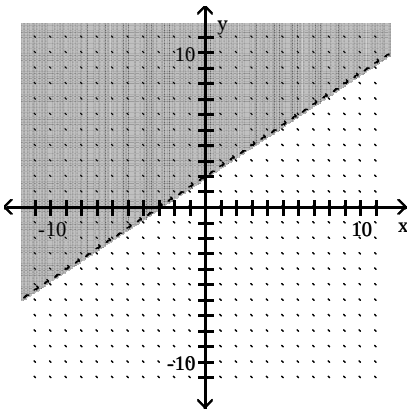
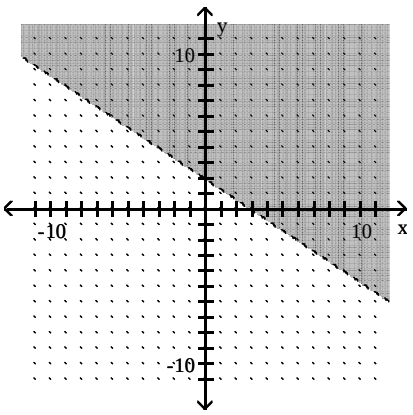
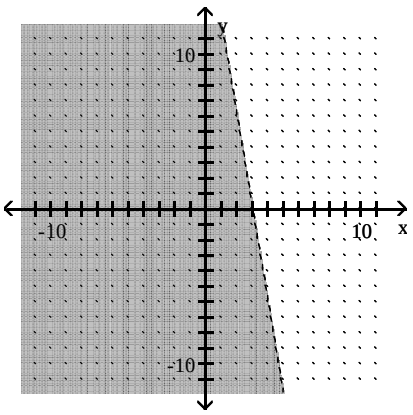


C)

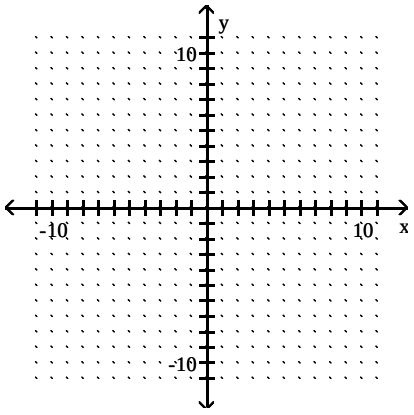


D)

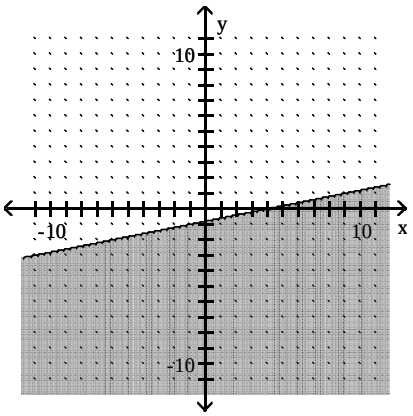


Objective: (4.4) Graph a Linear Inequality in Two Variables

75) $x + 5y \geq -4$ 75) _____



A)



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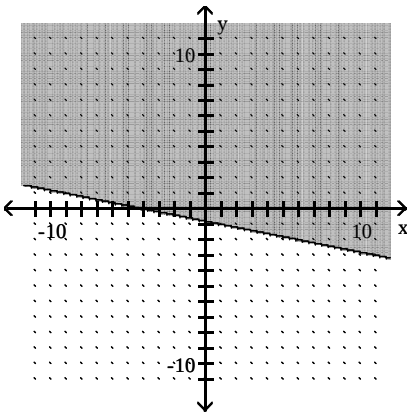
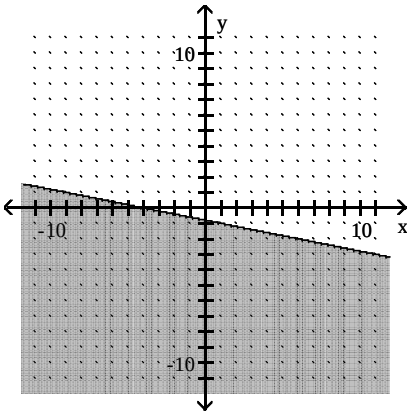
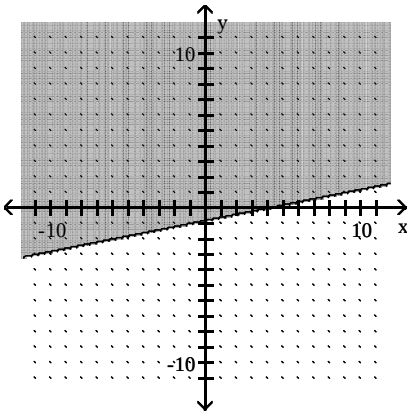


C)

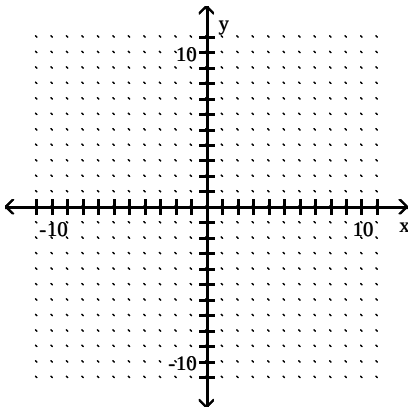


D)

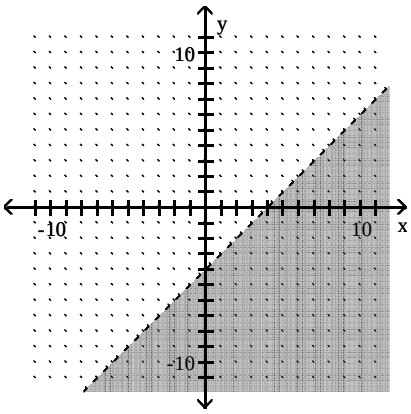


Objective: (4.4) Graph a Linear Inequality in Two Variables

76) $x + y < -4$ 76) _____



A)



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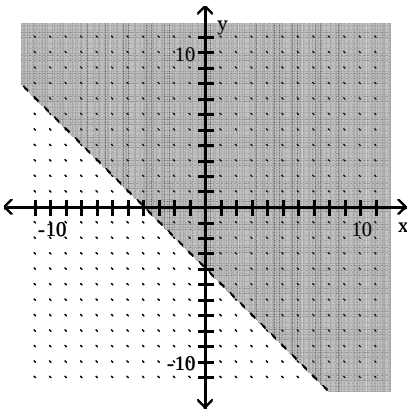

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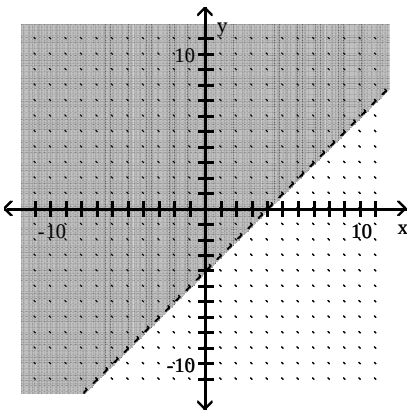
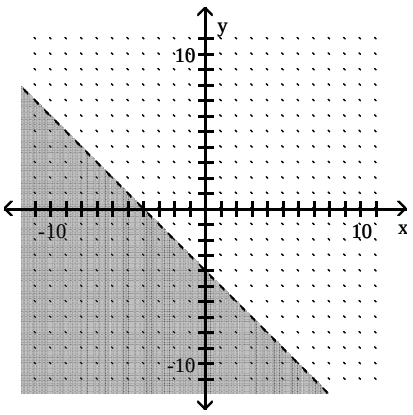


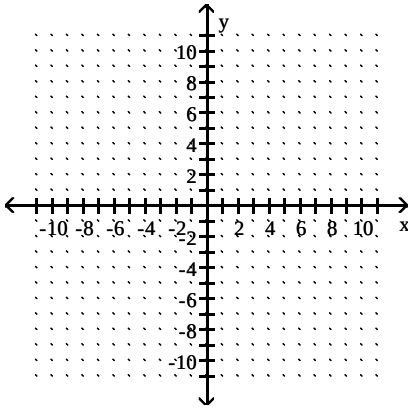
D)



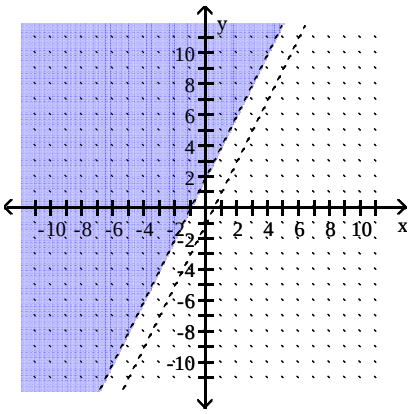
Objective: (4.4) Graph a Linear Inequality in Two Variables

Graph the solution set of the system of inequalities or indicate that the system has no solution.

77) $\begin{cases} -2x + y < 2 \\ -2x + y > -1 \end{cases}$ 77) _____



A)



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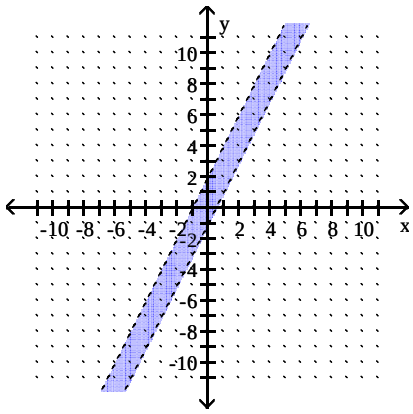
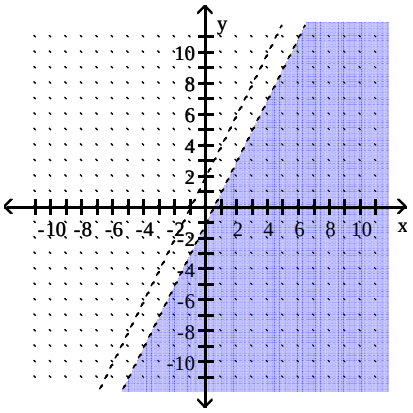


C)

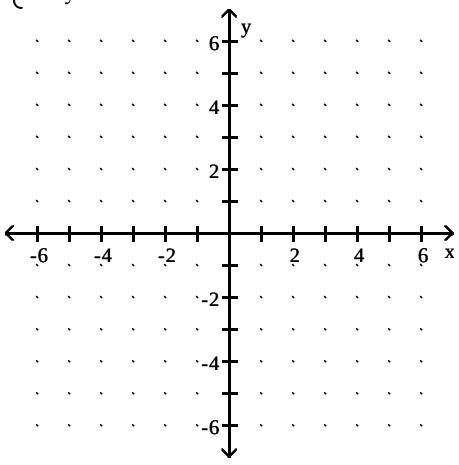


D) ∅

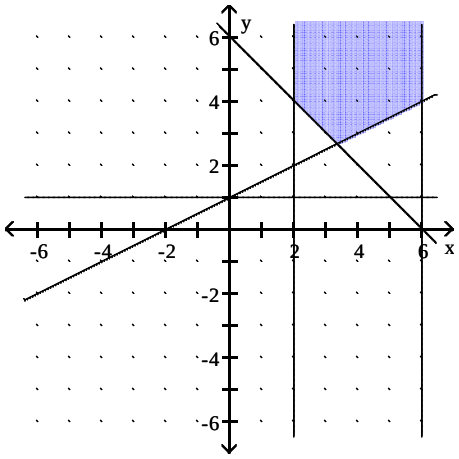
Objective: (4.4) Graph a System of Linear Inequalities

78) $\begin{cases} y \geq 1 \\ 2 \leq x \leq 6 \\ x - 2y \geq -2 \\ x + y \leq 6 \end{cases}$

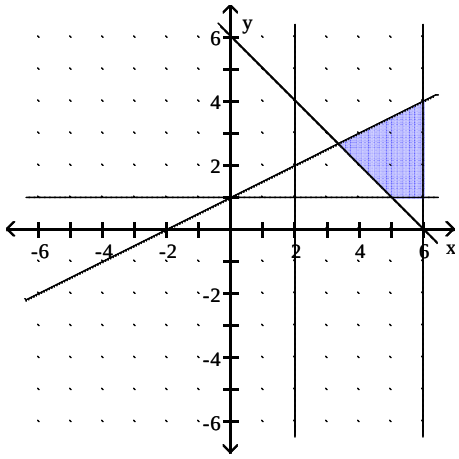
78) _____



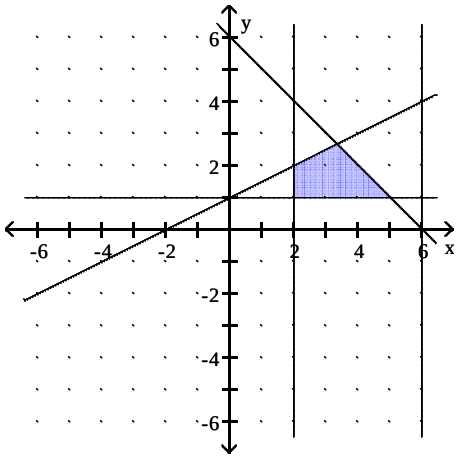
A)



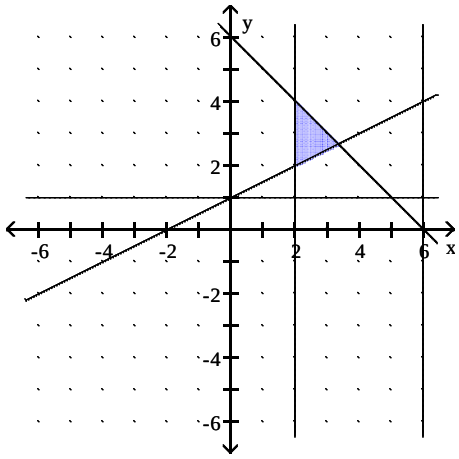
B)



C)



D)



Objective: (4.4) Graph a System of Linear Inequalities

Solve.

79) Yvette has up to $1000 to invest and has chosen to put her money into telecommunications and pharmaceuticals. The telecommunications investment is to be no more than 3 times the pharmaceuticals investment. Write a system of inequalities to describe the situation. Let x represent the amount (in dollars) invested in telecommunications and y represent the amount (in dollars) invested in pharmaceuticals. 79) _____

A) $x + y \le 1000$, $3x \le y$, $x \ge 0$, $y \ge 0$

B) $x + y = 1000$, $y \ge 3x$, $x \ge 0$, $y \ge 0$

C) $x + y = 1000$, $x \le 3y$, $x \ge 0$, $y \ge 0$

D) $x + y \le 1000$, $x \le 3y$, $x \ge 0$, $y \ge 0$

Objective: (4.4) Use Mathematical Models Involving Linear Inequalities

Given the polynomial functions, find the product function and the specified value.

80) Let $f(x) = x + 11$ and $g(x) = x - 3$. Find $(fg)(x)$ and $(fg)(-10)$. 80) _____

A) $(fg)(x) = x^2 - 8x - 33$; $(fg)(-10) = 147$

B) $(fg)(x) = x^2 + 8x + 33$; $(fg)(-10) = 53$

C) $(fg)(x) = x^2 + 8x - 33$; $(fg)(-10) = -13$

D) $(fg)(x) = x^2 + 14x + 33$; $(fg)(-10) = -7$

Objective: (5.2) Find the Product of Functions

Multiply the monomial and the polynomial. Assume any variable exponents represent whole numbers.

81) $3x^2y(-9x^2y^4 - 11xy^3 + 2)$ 81) _____

A) $-27x^4y^5 + 33x^3y^4 - 6x^2y$ B) $-27x^2y^5 - 33x^3y^4 + 6x^2y$

C) $-27x^4y^5 - 33x^3y^4 + 6$ D) $-27x^4y^5 - 33x^3y^4 + 6x^2y$

Objective: (5.2) Multiply a Monomial and a Polynomial

Multiply the monomials. Assume any variable exponents represent whole numbers.

82) $(12x^4y)(-7x^2y^5)$ 82) _____

A) $5x^6y^6$ B) $-84x^6y^5$ C) $5x^8y^5$ D) $-84x^6y^6$

Objective: (5.2) Multiply Monomials

Find the product. Assume all variable exponents represent whole numbers.

83) $(x + y)(x^2 + 10xy - y^2)$ 83) _____

A) $x^3y + 10x^2y - xy^3$ B) $x^3 + 10x^2y - xy^2$

C) $x^3 + 10x^2y + 10xy^2 - y^3$ D) $x^3 + 11x^2y + 9xy^2 - y^3$

Objective: (5.2) Multiply Polynomials When Neither is a Monomial

84) $(x - 12)(x^2 + 4x - 9)$ 84) _____

A) $x^3 + 16x^2 + 39x - 108$ B) $x^3 - 8x^2 - 39x - 108$

C) $x^3 + 16x^2 + 57x + 108$ D) $x^3 - 8x^2 - 57x + 108$

Objective: (5.2) Multiply Polynomials When Neither is a Monomial

Multiply using the rule for the product of the sum and difference of two terms. Assume any variable exponents represent whole numbers.

85) $[7y + (8x + 3)][7y - (8x + 3)]$ 85) _____

A) $49y^2 - 64x^2 - 48x - 9$ B) $49y^2 - 64x^2 + 48x + 9$

C) $49y^2 - 64x^2 - 24x - 9$ D) $49y^2 - 64x^2 - 48x + 9$

Objective: (5.2) Multiply the Sum and Difference of Two Terms

86) $(13a^n - 4b^n)(13a^n + 4b^n)$ 86) _____

A) $169a^{2n} - 16b^{2n}$ B) $13a^{2n} - 4b^{2n}$

C) $169a^n - 16b^n$ D) $169a^{2n} + 104a^nb^n - 16b^{2n}$

Objective: (5.2) Multiply the Sum and Difference of Two Terms

87) $(1 + x^4)(1 - x^4)$ 87) _____

A) $2 - x^{16}$ B) $2 - x^8$ C) $1 - x^8$ D) $1 - x^{16}$

Objective: (5.2) Multiply the Sum and Difference of Two Terms

Multiply using one of the rules for the square of a binomial. Assume any variable exponents represent whole numbers.

88) $(x + 8)^2$ 88) _____

A) $x + 64$ B) $x^2 + 16x + 64$ C) $64x^2 + 16x + 64$ D) $x^2 + 64$

Objective: (5.2) Square Binomials

89) $(x + y + 5)^2$ 89) _____

A) $x^2 + 2xy + y^2 + 10x + 10y + 25$ B) $x^2 + 2xy + y^2 + 25$

C) $x^2 + y^2 + 25$ D) $x^2 + y^2 + 10x + 10y + 25$

Objective: (5.2) Square Binomials

90) $(5x + 6y)^2$ 90) _____

A) $5x^2 + 36y^2$ B) $5x^2 + 60xy + 36y^2$

C) $25x^2 + 36y^2$ D) $25x^2 + 60xy + 36y^2$

Objective: (5.2) Square Binomials

Use the FOIL method to multiply the binomials. Assume any variable exponents represent whole numbers.

91) $(9x - 11y)(5x - 2y)$ 91) _____

A) $45x^2 - 18xy + 22y^2$ B) $45x^2 - 73xy + 22y^2$

C) $45x^2 - 55xy + 22y^2$ D) $45x^2 - 73xy - 73y^2$

Objective: (5.2) Use FOIL in Polynomial Multiplication

92) $(x + 3)(x + 1)$ 92) _____

A) $x^2 + 4x + 3$ B) $x^2 + 3x + 4$ C) $x^2 + 4x + 4$ D) $x^2 + 3x + 3$

Objective: (5.2) Use FOIL in Polynomial Multiplication

93) $(x - 2)(x^2 - 5)$ 93) _____

A) $x^3 + 2x^2 + 5x + 10$ B) $x^3 - 2x^2 - 5x + 10$

C) $x^3 - 7x^2 + 10$ D) $x^3 - 7x + 10$

Objective: (5.2) Use FOIL in Polynomial Multiplication

Evaluate the polynomial function.

94) If $f(x) = x^2 + 6x + 5$, find $f(a + h)$. 94) _____

A) $a^2 + h^2 + 6a + 6h + 5$ B) $a^2 + 2ah + h^2 + 6a + 6h + 5$

C) $a^2 + ah + h^2 + 6a + 6h + 6$ D) $a^2 + h^2 + 6a + 6h + 10$

Objective: (5.2) Use Polynomial Multiplication to Evaluate Functions

Factor the polynomial using the greatest common binomial factor.

95) $4x^2(7x - 1) + 7x - 1$ 95) _____

A) $(7x - 1)(4x^2 + 1)$ B) $4x^2(7x - 1)$ C) $(7x + 1)(4x^2 + 1)$ D) $(7x - 1)(4x^2 - 1)$

Objective: (5.3) Factor by Grouping

Factor by grouping. Assume any variable exponents represent whole numbers.

96) $4x^3 + 20x^2 + 9x + 45$ 96) _____

A) $(x - 5)(4x^2 + 9)$ B) $(x + 5)(4x^2 + 9)$ C) $(x + 5)(4x + 9)$ D) $(x + 5)(4x^2 - 9)$

Objective: (5.3) Factor by Grouping

97) $ax^2 + 2ax - 8a - bx^2 - 2bx + 8b$ 97) _____

A) $(x^2 + 2x - 8)(a - b)$ B) $(x^2 - 2x + 8)(b - a)$

C) $(x^2 + 2x - 8)(a + b)$ D) $(x^2 - 2x + 8)(a - b)$

Objective: (5.3) Factor by Grouping

98) $15x^2 - 18xy + 10xy - 12y^2$ 98) _____

A) $(15x + 2y)(x - 6y)$ B) $(3x - 2y)(5x - 6y)$

C) $(3x + 2y)(5x - 6y)$ D) $(3x + 2)(5x - 6)$

Objective: (5.3) Factor by Grouping

99) $24x^2 + 30x - 20x - 25$ 99) _____

A) $(24x - 5)(x + 5)$ B) $(6x - 5)(4x + 5)$ C) $(24x + 5)(x - 5)$ D) $(6x + 5)(4x - 5)$

Objective: (5.3) Factor by Grouping

Factor out the negative of the greatest common factor. Assume any variable exponents represent whole numbers.

100) $-5x^3 - 10x^2 + 45x$ 100) _____

A) $-x(5x^2 - 10x + 45)$ B) $-5(x^3 + 2x^2 - 9x)$

C) $-5x(x^2 + 2x - 9)$ D) $-5x(x^2 - 2x + 9)$

Objective: (5.3) Factor Out a Common Factor with a Negative Coefficient

Solve the problem.

101) A projectile is fired straight upward. The function $f(t) = -16t^2 + 72t$ describes the height of the projectile, f(t), in feet, t seconds after firing. Factor the polynomial $-16t^2 + 72t$ and write the function in factored form. Use the factored form of the function to find f(2). 101) _____

A) $f(t) = -8t(2t - 9)$; 80 ft B) $f(t) = t(-16t + 72)$; 112 ft

C) $f(t) = -8t(2t - 9)$; 112 ft D) $f(t) = t(-16t + 72)$; 80 ft

Objective: (5.3) Factor Out a Common Factor with a Negative Coefficient

Factor the greatest common factor from the polynomial. Assume any variable exponents represent whole numbers.

102) $27x^3y + 24xy^4$ 102) _____

A) $3xy(9x^2 + 8y^3)$ B) $3x(9x^2y + 8y^4)$ C) $3y(9x^3 + 8xy^3)$ D) $xy(27x^2 + 24y^3)$

Objective: (5.3) Factor Out the Greatest Common Factor of a Polynomial

103) $3x^2 + 21x$ 103) _____

A) $x(3x + 21)$ B) $3x(x + 7)$ C) $3(x^2 + 7x)$ D) $3x(x + 7x)$

Objective: (5.3) Factor Out the Greatest Common Factor of a Polynomial

104) $24x^9y^8z^2 + 56x^4y^4z^3 + 40x^6y^2z^4$ 104) _____

A) $8x^4y^2z^3(3x^5y^6 + 7y^2 + 5x^2z)$ B) $8(3x^9y^8z^2 + 7x^4y^4z^3 + 5x^6y^2z^4)$

C) $x^4y^2z^2(24x^5y^6 + 56y^2z + 40x^2z^2)$ D) $8x^4y^2z^2(3x^5y^6 + 7y^2z + 5x^2z^2)$

Objective: (5.3) Factor Out the Greatest Common Factor of a Polynomial

Factor completely, or state that the trinomial is prime.

105) $2x^3 - 12x^2 + 16x$ 105) _____

A) $2x(x - 8)(x + 1)$ B) prime

C) $(x - 2)(2x^2 - 8x)$ D) $2x(x - 2)(x - 4)$

Objective: (5.4) Factor a Trinomial Whose Leading Coefficient is 1

Factor the trinomial, or state that the trinomial is prime.

106) $a^2 + 4a - 45$ 106) _____

A) $(a + 9)(a - 5)$ B) $(a - 9)(a + 1)$ C) prime D) $(a - 9)(a - 5)$

Objective: (5.4) Factor a Trinomial Whose Leading Coefficient is 1

Factor completely, or state that the trinomial is prime.

107) $4x^2 - 32x + 60$ 107) _____

A) prime B) $4(x - 5)(x - 3)$ C) $(x - 5)(4x - 12)$ D) $4(x - 15)(x + 1)$

Objective: (5.4) Factor a Trinomial Whose Leading Coefficient is 1

Factor the trinomial, or state that the trinomial is prime.

108) $x^2 + 8x - 33$ 108) _____

A) $(x - 11)(x + 1)$ B) prime C) $(x - 11)(x + 3)$ D) $(x + 11)(x - 3)$

Objective: (5.4) Factor a Trinomial Whose Leading Coefficient is 1

Factor completely, or state that the trinomial is prime.

109) $36x^3 + 84x^2 + 40x$ 109) _____

A) $4x(3x + 1)(3x + 10)$ B) $4x(3x + 5)(3x + 2)$

C) $4x(10x + 5)(x + 2)$ D) prime

Objective: (5.4) Factor a Trinomial Whose Leading Coefficient is Not 1

Use the method of your choice to factor the trinomial, or state that the trinomial is prime.

110) $9x^2 - 6x - 8$ 110) _____

A) $(3x - 2)(3x + 4)$ B) $(9x + 2)(x - 4)$ C) prime D) $(3x + 2)(3x - 4)$

Objective: (5.4) Factor a Trinomial Whose Leading Coefficient is Not 1

Factor completely, or state that the trinomial is prime.

111) $12x^4 + 21x^3 - 6x^2$ 111) _____

A) prime B) $3x^2(4x - 1)(x - 2)$

C) $3x^2(4x + 1)(x - 2)$ D) $3x^2(4x - 1)(x + 2)$

Objective: (5.4) Factor a Trinomial Whose Leading Coefficient is Not 1

Use the method of your choice to factor the trinomial, or state that the trinomial is prime.

112) $2x^2 - x - 10$ 112) _____

A) $(2x - 2)(x + 5)$ B) $(2x + 5)(x - 2)$ C) $(2x + 2)(x - 5)$ D) $(2x - 5)(x + 2)$

Objective: (5.4) Factor a Trinomial Whose Leading Coefficient is Not 1

Factor the trinomial by grouping, or state that the trinomial is prime.

113) $6x^2 - x - 22$ 113) _____

A) $(6x - 2)(x + 11)$ B) $(6x + 2)(x - 11)$ C) $(6x + 11)(x - 2)$ D) $(6x - 11)(x + 2)$

Objective: (5.4) Factor Trinomials By Grouping

114) $5x^2 + 23x - 12$ 114) _____

A) $(5x - 3)(x + 4)$ B) $(5x + 3)(x - 4)$ C) $(5x - 4)(x + 3)$ D) prime

Objective: (5.4) Factor Trinomials By Grouping

115) $15y^2 - 32y + 16$ 115) _____

A) prime B) $(15y + 4)(y + 4)$ C) $(3y + 4)(5y + 4)$ D) $(3y - 4)(5y - 4)$

Objective: (5.4) Factor Trinomials By Grouping

Factor by introducing an appropriate substitution.

116) $11(x + 7)^2 + 16(x + 7) + 5$ 116) _____

A) $(11x + 8)(x + 12)$ B) $(11x + 12)(x + 8)$

C) $(11x + 82)(x + 8)$ D) $(11x + 78)(x + 12)$

Objective: (5.4) Factor Using a Substitution

117) $7(x - 9)^2 - 20(x - 9) - 3$ 117) _____

A) $(x - 8)(x - 6)$ B) $(7x - 56)(x - 12)$ C) $(7x - 8)(x - 12)$ D) $(7x - 62)(x - 12)$

Objective: (5.4) Factor Using a Substitution

Factor any perfect square trinomial, or state that the polynomial is prime.

118) $x^2 - 8x + 64$ 118) _____

A) $(x - 8)^2$ B) $(x + 8)^2$ C) $(x + 8)(x - 8)$ D) prime

Objective: (5.5) Factor Perfect Square Trinomials

Factor any difference of two squares, or state that the polynomial is prime. Assume any variable exponents represent whole numbers.

119) $25x^4 - 144y^6$ 119) _____

A) prime B) $(5x^2 - 12y^3)^2$

C) $(5x^2 + 12y^3)(5x^2 - 12y^3)$ D) $(5x^2 + 12y^3)^2$

Objective: (5.5) Factor the Difference of Two Squares

120) $64x^2 + 49$ 120) _____

A) prime B) $(8x - 7)^2$ C) $(8x + 7)(8x - 7)$ D) $(8x + 7)^2$

Objective: (5.5) Factor the Difference of Two Squares

Factor completely, or state that the polynomial is prime. Assume any variable exponents represent whole numbers.

121) $6x^3 - 24x$ 121) _____

A) $6x(x + 2)(x - 2)$ B) $6(x + 2)(x^2 - 2x)$

C) prime D) $x(x + 2)(6x - 12)$

Objective: (5.5) Factor the Difference of Two Squares

Factor any difference of two squares, or state that the polynomial is prime. Assume any variable exponents represent whole numbers.

122) $25 - y^2$ 122) _____

A) $(5 + y)^2$ B) $(5 + y)(5 - y)$ C) $(5 - y)^2$ D) prime

Objective: (5.5) Factor the Difference of Two Squares

123) $81 - a^{2n}$ 123) _____

A) $(9 + a)(9 - a)$ B) prime

C) $(9 + a^{2n})(9 - a^{2n})$ D) $(9 + a^{n})(9 - a^{n})$

Objective: (5.5) Factor the Difference of Two Squares

124) $(x - 4)^2 - y^2$ 124) _____

A) $(x + 4 + y)(x - 4 - y)$ B) $(x - 4 + y)(x - 4 - y)$

C) $(x + 4 - y)(x - 4 - y)$ D) prime

Objective: (5.5) Factor the Difference of Two Squares

Factor using the formula for the sum or difference of two cubes.

125) $y^3 + 8$ 125) _____

A) $(y + 2)(y^2 + 4)$ B) $(y + 2)(y^2 - 2y + 4)$

C) $(y - 8)(y^2 - 1)$ D) $(y - 2)(y^2 + 2y + 4)$

Objective: (5.5) Factor the Sum or Difference of Two Cubes

126) $x^3 - 8$ 126) _____

A) $(x + 8)(x^2 - 1)$ B) $(x - 2)(x^2 + 2x + 4)$

C) $(x + 2)(x^2 - 2x + 4)$ D) $(x - 2)(x^2 + 4)$

Objective: (5.5) Factor the Sum or Difference of Two Cubes

Factor by grouping to obtain the difference of two squares.

127) $x^4 - x^2 + 22x - 121$ 127) _____

A) $(x^2 + x + 11)(x^2 - x + 11)$ B) $(x^2 + x + 11)(x^2 - x - 11)$

C) $(x^2 + x - 11)(x^2 - x + 11)$ D) $(x^2 + x - 11)(x^2 - x - 11)$

Objective: (5.5) Use Grouping to Obtain the Difference of Two Squares

Factor completely, or state that the polynomial is prime.

128) $50x^3 - 120x^2y + 72xy^2$ 128) _____

A) prime B) $2x(5x - 6y)^2$

C) $2x(5x - 6y)(5x + 6y)$ D) $2x(5x + 6y)^2$

Objective: (5.6) Use a General Strategy for Factoring Polynomials

129) $2x^3 - 162x$ 129) _____

A) prime B) $2(x + 9)(x^2 - 9x)$

C) $2x(x + 9)(x - 9)$ D) $x(x + 9)(2x - 18)$

Objective: (5.6) Use a General Strategy for Factoring Polynomials

130) $40x^3 + 5x^6 + 75$ 130) _____

A) $5(x^3 + 3)(x^3 + 5)$ B) $(x^3 + 3)(5x^3 + 25)$

C) $5(x + 3)(x + 5)$ D) prime

Objective: (5.6) Use a General Strategy for Factoring Polynomials

131) $(c + d)^4 - 625$ 131) _____

A) prime
B) $(c^2 + 2cd + d^2 + 25)(c + d + 5)(c + d - 5)$
C) $(c + d + 5)^2(c + d - 5)^2$
D) $(c^2 + 2cd + d^2 + 25)(c^2 + 2cd + d^2 - 25)$

Objective: (5.6) Use a General Strategy for Factoring Polynomials

132) $x^8 - 1$ 132) _____

A) $(x^2 - 1)^4$
B) $(x^4 + 1)(x^2 + 1)(x + 1)(x - 1)$
C) prime
D) $(x^4 - 1)^2$

Objective: (5.6) Use a General Strategy for Factoring Polynomials

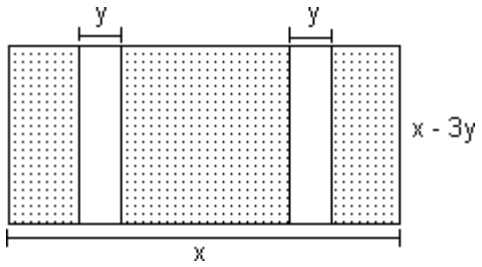
133) $x^2(a - b) + 16(b - a)$ 133) _____

A) prime
B) $(a - b)(x + 4)(x - 4)$
C) $(a - b)(x^2 + 16)$
D) $(b - a)(x + 4)(x - 4)$

Objective: (5.6) Use a General Strategy for Factoring Polynomials

Write an expression in completely factored form for the area of the shaded figure.

134) 134) _____



A) $5(x - y)^2$ B) $(x - y)(x - 3y)$ C) $(x - 5y)^2$ D) $(x - 2y)(x - 3y)$

Objective: (5.6) Use a General Strategy for Factoring Polynomials

Factor completely, or state that the polynomial is prime.

135) $a^3 - ab^2 - a^2b + b^3$ 135) _____

A) prime B) $(a - b)(a + b)$ C) $(a - b)^2(a + b)$ D) $(a + b)^2(a - b)$

Objective: (5.6) Use a General Strategy for Factoring Polynomials

Use factoring to solve the polynomial equation.

136) $x^3 - 4x^2 - 12x = 0$ 136) _____

A) {–2, 6} B) {2, –6} C) {0, –2, 6} D) {0, 2, –6}

Objective: (5.7) Solve Higher–Degree Polynomial Equations by Factoring

Solve the problem.

137) A machine produces open boxes using square sheets of plastic. The machine cuts equal–sized squares measuring 3 inches on a side from each corner of the sheet, and then shapes the plastic into an open box by turning up the sides. If each box must have a volume of 675 cubic inches, find the length of one side of the open box. 137) _____

A) 21 in. B) 14 in. C) 18 in. D) 15 in.

Objective: (5.7) Solve Problems Using Polynomial Equations

138) If the cost, C(x), for manufacturing x units of a certain product is given by $C(x) = x^2 - 40x + 9600$, find the number of units manufactured at a cost of \$14,100. 138) _____

A) 120 units B) 90 units C) 80 units D) 50 units

Objective: (5.7) Solve Problems Using Polynomial Equations

Use factoring to solve the quadratic equation.

139) $5x(x + 5) = (4x - 8)(x + 5)$ 139) _____

A) {–5, –8} B) {5, 8} C) {8} D) {–8}

Objective: (5.7) Solve Quadratic Equations by Factoring

140) $x^2 + 12x = -36$ 140) _____

A) {–6, 6] B) {6} C) {–6} D) $\{-\sqrt{6}\}$

Objective: (5.7) Solve Quadratic Equations by Factoring

141) $x^2 + 3x - 40 = 0$ 141) _____

A) {8, –5} B) {–8, 1} C) {8, 5} D) {–8, 5}

Objective: (5.7) Solve Quadratic Equations by Factoring

142) $11x^2 = 8x$ 142) _____

A) $\left\{-\frac{11}{8}, 0\right\}$ B) $\left\{\frac{11}{8}, 0\right\}$ C) $\left\{\frac{8}{11}, 0\right\}$ D) $\left\{-\frac{8}{11}, 0\right\}$

Objective: (5.7) Solve Quadratic Equations by Factoring

Find the indicated function value for the function.

143) Evaluate $f(x) = \sqrt[3]{x + 7}$ for f(–15) 143) _____

A) 2 B) not a real number

C) –8 D) –2

Objective: (7.1) Evaluate Cube Root Functions

144) Evaluate $f(x) = \sqrt[3]{x + 2}$ for f(6) 144) _____

A) 8 B) 2, –2 C) 4 D) 2

Objective: (7.1) Evaluate Cube Root Functions

Find the function value indicated for the function. If necessary, round to two decimal places. If the function value is not a real number and does not exist, state so.

145) Evaluate $e(x) = \sqrt{x + 13}$ for e(–4) 145) _____

A) 3 B) –3

C) not a real number D) 1.73

Objective: (7.1) Evaluate Square Root Functions

146) Evaluate $p(x) = \sqrt{x - 25}$ for p(1) 146) _____

A) $-\sqrt{24}$ B) not a real number

C) 24 D) –4

Objective: (7.1) Evaluate Square Root Functions

Find the square root if it is a real number, or state that the expression is not a real number.

147) $\sqrt{\frac{49}{16}}$ 147) _____

A) $\frac{7}{4}$ B) $\frac{7}{5}$ C) 3 D) 2

Objective: (7.1) Evaluate Square Roots

148) $\sqrt{16+9}$ 148) _____

A) 25 B) 7 C) 5 D) $\sqrt{7}$

Objective: (7.1) Evaluate Square Roots

Find the indicated root, or state that the expression is not a real number.

149) $\sqrt[5]{-1}$ 149) _____

A) -1 B) $-\frac{1}{5}$

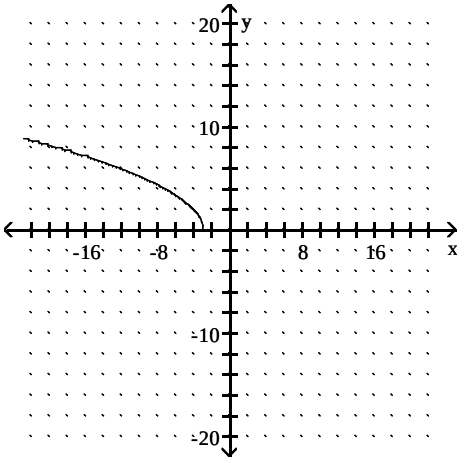
C) 1 D) not a real number

Objective: (7.1) Find Even and Odd Roots

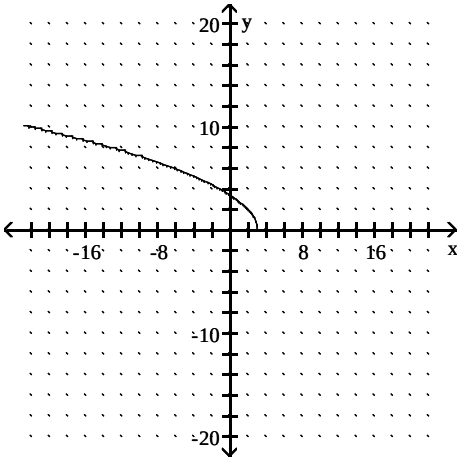
Find the domain of the square root function. Then use the domain to choose the correct graph of the function.

150) $f(x) = \sqrt{12 - 4x}$ 150) _____

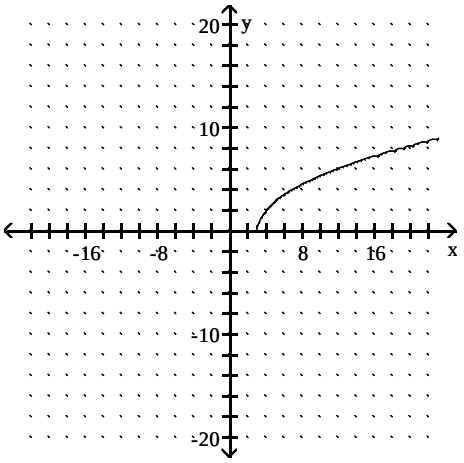
A) domain of f: $(-\infty, -3]$



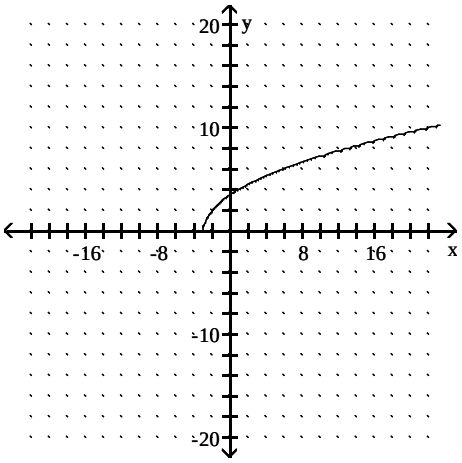
B) domain of f: $(-\infty, 3]$



C) domain of f: $[3, \infty)$



D) domain of f: $[-3, \infty)$



Objective: (7.1) Find the Domain of Square Root Functions

Find the indicated root, or state that the expression is not a real number.

151) $\sqrt[3]{-27}$ 151) _____

A) –3

B) $-\sqrt[3]{3}$

C) not a real number

D) 3

Objective: (7.1) Simplify Expressions of the Form Cube–Root(a^3)

Simplify the expression. Include absolute value bars where necessary.

152) $\sqrt[3]{(-4)^3}$ 152) _____

A) 4 B) $|-4|$ C) –4 D) $(-4)^3$

Objective: (7.1) Simplify Expressions of the Form nth–root(a^n)

153) $\sqrt[5]{t^5}$ 153) _____

A) t^5 B) t C) $\sqrt[5]{t}$ D) –t

Objective: (7.1) Simplify Expressions of the Form nth–root(a^n)

Simplify the expression.

154) $\sqrt{(-7)^2}$ 154) _____

A) 49 B) −7 C) $-\sqrt{7}$ D) 7

Objective: (7.1) Simplify Expressions of the Form Square−Root(a^2)

155) $\sqrt{(x + 2)^2}$ 155) _____

A) $2\sqrt{x}$ B) $|x + 2|$ C) $x^2 + 4x + 4$ D) $x + 2$

Objective: (7.1) Simplify Expressions of the Form Square−Root(a^2)

Solve the problem.

156) The formula $v = \sqrt{2.5r}$ models the safe maximum speed, v, in miles per hour, at which a car can travel on a curved road with radius of curvature, r, in feet. A highway crew measures the radius of curvature at an exit ramp as 1210 feet. What is the maximum safe speed? 156) _____

A) 52 mph B) 121 mph C) 55 mph D) 60 mph

Objective: (7.1) Use Models That Are Square Root Functions

Solve.

157) The function $f(x) = 70x^{3/4}$ models the number of calories per day, f(x), a person needs to maintain life in terms of the person's weight, x, in kilograms. How many calories does a person who weighs 53 kilograms (approximately 116.6 pounds) need to maintain life? Round to the nearest whole number. 157) _____

A) 2486 calories B) 2701 calories C) 1375 calories D) 4754 calories

Objective: (7.2) Simplify Expressions with Rational Exponents

Use properties of rational exponents to simplify the expression. Assume that any variables represent positive numbers.

158) $\dfrac{x^{1/5}\ x^{2/7}}{x^{1/6}}$ 158) _____

A) $\dfrac{1}{x^{67/210}}$ B) $x^{67/210}$ C) $\dfrac{1}{x^{137/210}}$ D) $x^{137/210}$

Objective: (7.2) Simplify Expressions with Rational Exponents

Solve.

159) The function $f(x) = 0.07x^{3/2}$ models the duration of a storm, f(x), in hours, in terms of the diameter of the storm, x, in miles. Use a calculator to determine the duration of a storm with a diameter of 12 miles. Round to the nearest hundredth. 159) _____

A) 0.24 hr B) 41.57 hr C) 0.77 hr D) 2.91 hr

Objective: (7.2) Simplify Expressions with Rational Exponents

Use rational exponents to simplify the radical. If rational exponents appear after simplifying, write the answer in radical notation.

160) $\sqrt[9]{(10y)^3}$ 160) _____

A) $\sqrt[3]{10y}$ B) $\sqrt[6]{10y}$ C) $\sqrt[3]{10y^3}$ D) $1000y^3$

Objective: (7.2) Simplify Radical Expressions Using Rational Exponents

161) $\sqrt[12]{8}$ 161) _____

A) $2\sqrt[4]{2}$ B) $\frac{1}{16}$ C) $\sqrt[3]{2}$ D) $\sqrt[4]{2}$

Objective: (7.2) Simplify Radical Expressions Using Rational Exponents

Rewrite the expression with a positive rational exponent. Simplify, if possible.

162) $(-27)^{-2/3}$ 162) _____

A) 18 B) – 9 C) $\frac{1}{9}$ D) $-\frac{1}{9}$

Objective: (7.2) Use the Definition of a^(–m/n)

Rewrite the expression with a rational exponent.

163) $\sqrt[4]{39}$ 163) _____

A) $39^{1/4}$ B) 39^4 C) $\frac{1}{4} \cdot 39$ D) $\frac{1}{39^4}$

Objective: (7.2) Use the Definition of a^(1/n)

Use radical notation to rewrite the expression. Simplify, if possible.

164) $(-64)^{1/3}$ 164) _____

A) $-4\sqrt[3]{16}$ B) 4 C) $-\frac{1}{4}$ D) –4

Objective: (7.2) Use the Definition of a^(1/n)

165) $(-1000)^{2/3}$ 165) _____

A) –10 B) $-\frac{1}{10}$ C) – 100 D) 100

Objective: (7.2) Use the Definition of a^(m/n)

Rewrite the expression with a rational exponent.

166) $(\sqrt{15xy})^3$ 166) _____

A) $(15xy)^{2/3}$ B) $\frac{(15xy)^3}{2}$ C) $\frac{(15xy)^2}{3}$ D) $(15xy)^{3/2}$

Objective: (7.2) Use the Definition of a^(m/n)

Use radical notation to rewrite the expression. Simplify, if possible.

167) $(-8)^{4/3}$ 167) _____

A) –16 B) 64

C) not a real number D) 16

Objective: (7.2) Use the Definition of a^(m/n)

Multiply and simplify. Assume that all variables in a radicand represent positive real numbers.

168) $\sqrt[4]{4} \cdot \sqrt[4]{8}$ 168) _____

A) $2\sqrt[4]{2}$ B) $2\sqrt[4]{8}$ C) $\sqrt[4]{32}$ D) $\sqrt[4]{2}$

Objective: (7.3) Multiply Radicals and Then Simplify

Simplify by factoring.

169) $\sqrt{28x^2y}$ 169) _____

A) $2xy^2\sqrt{7}$ B) $2x^2\sqrt{7y}$ C) $2xy\sqrt{7}$ D) $2x\sqrt{7y}$

Objective: (7.3) Use Factoring and the Product Rule to Simplify Radicals

170) $\sqrt[3]{864}$ 170) _____

A) 24 B) 6 C) $6\sqrt[3]{4}$ D) $6\sqrt[3]{24}$

Objective: (7.3) Use Factoring and the Product Rule to Simplify Radicals

171) $\sqrt{98}$ 171) _____

A) $7\sqrt{2}$ B) 9 C) $2\sqrt{7}$ D) 14

Objective: (7.3) Use Factoring and the Product Rule to Simplify Radicals

Simplify by factoring. Assume that any variable in a radicand represents a positive real number.

172) $\sqrt[6]{(x+k)^{23}}$ 172) _____

A) $x^3 + 27\sqrt[6]{(x+k)^5}$ B) $(x+k)^3\sqrt[6]{(x+k)^5}$

C) $(x+k)\sqrt[6]{x+k}$ D) $(x+k)^3\sqrt[6]{x+k}$

Objective: (7.3) Use Factoring and the Product Rule to Simplify Radicals

Use the product rule to multiply.

173) $\sqrt{x+3} \cdot \sqrt{x-3}$ 173) _____

A) $\sqrt{x^2-9}$ B) $x^2 - 9$ C) $\sqrt{x^2+6x+9}$ D) $\sqrt{2x}$

Objective: (7.3) Use the Product Rule to Multiply Radicals

174) $\sqrt[4]{\frac{x}{16}} \cdot \sqrt[4]{\frac{16}{y}}$ 174) _____

A) $\frac{1}{2}\sqrt[4]{\frac{x}{y}}$ B) $2\sqrt[4]{\frac{x}{y}}$ C) $\sqrt[4]{\frac{x}{y}}$ D) $\sqrt[8]{\frac{x}{y}}$

Objective: (7.3) Use the Product Rule to Multiply Radicals

Add or subtract as indicated.

175) $12\sqrt[3]{3} + 15\sqrt[3]{3}$ 175) _____

A) $27\sqrt[3]{3}$ B) $3\sqrt[3]{3}$ C) $27\sqrt[3]{6}$ D) $27\sqrt[3]{9}$

Objective: (7.4) Add and Subtract Radical Expressions

176) $17\sqrt{14} - 2\sqrt[3]{x} + 18\sqrt{14} - 3\sqrt[3]{x}$ 176) _____

A) $-1\sqrt{14} - 5\sqrt[3]{x}$ B) $35\sqrt{14} - \sqrt[3]{x}$ C) $35\sqrt{14} - 5\sqrt[3]{x}$ D) $-1\sqrt{14} + \sqrt[3]{x}$

Objective: (7.4) Add and Subtract Radical Expressions

177) $8\sqrt{5} + 5\sqrt{5}$ 177) _____

A) $13\sqrt{5}$ B) $13\sqrt{10}$ C) $3\sqrt{5}$ D) $40\sqrt{10}$

Objective: (7.4) Add and Subtract Radical Expressions

178) $7\sqrt{14} + \sqrt{3} - 6\sqrt{14}$ 178) _____

A) $\sqrt{3}$ B) $\sqrt{14} + \sqrt{3}$ C) $13\sqrt{14} + \sqrt{3}$ D) $\sqrt{17}$

Objective: (7.4) Add and Subtract Radical Expressions

179) $8\sqrt{7} + 17\sqrt{7}$ 179) _____

A) $25\sqrt{7}$ B) $-26\sqrt{7}$ C) $-9\sqrt{7}$ D) $10\sqrt{7}$

Objective: (7.4) Add and Subtract Radical Expressions

Add or subtract as indicated. You will need to simplify terms to identify like radicals.

180) $\sqrt[3]{8y} - \sqrt[3]{54y}$ 180) _____

A) $2\sqrt[3]{y} - 3\sqrt[3]{2y}$ B) $3\sqrt[3]{2y} - 2\sqrt[3]{y}$ C) $5\sqrt[3]{y}$ D) $2 - 3\sqrt[3]{2}$

Objective: (7.4) Add and Subtract Radical Expressions

Divide and, if possible, simplify.

181) $\dfrac{\sqrt[3]{500a^5b^6}}{\sqrt[3]{4a^2}}$ 181) _____

A) $5ab^2\sqrt[3]{5ab}$ B) $5a^2b^4$ C) $5a^2\,b^4\sqrt[3]{5a}$ D) $5ab^2$

Objective: (7.4) Use the Quotient Rule to Divide Radical Expressions

182) $\dfrac{\sqrt{252x^7}}{\sqrt{7x}}$ 182) _____

A) $6\sqrt{x^7}$ B) $6x^3\sqrt{7}$ C) $6x^6$ D) $6x^3$

Objective: (7.4) Use the Quotient Rule to Divide Radical Expressions

183) $\dfrac{\sqrt{100}}{\sqrt{5}}$ 183) _____

A) $\dfrac{\sqrt{500}}{5}$ B) $\dfrac{\sqrt{100}}{5}$ C) 5 D) $2\sqrt{5}$

Objective: (7.4) Use the Quotient Rule to Divide Radical Expressions

Use the quotient rule to simplify. Assume all variables represent positive real numbers.

184) $\sqrt{\dfrac{6}{x^4}}$ 184) _____

A) $\dfrac{\sqrt{6}}{\sqrt{x^4}}$ B) $\dfrac{\sqrt{6}}{x^2}$ C) $\dfrac{\sqrt{6}}{x}$ D) $\dfrac{\sqrt{6x^4}}{x^4}$

Objective: (7.4) Use the Quotient Rule to Simplify Radical Expressions

Multiply and simplify. Assume that all variables represent positive real numbers.

185) $(3 - \sqrt{x})(6 - \sqrt{x})$ 185) _____

A) $18 - 9\sqrt{x} + x$ B) $18 - 8\sqrt{x}$ C) $18 - 8x$ D) $18 - 9\sqrt{x} - x$

Objective: (7.5) Multiply Radical Expressions with More Than One Term

Rationalize the denominator and simplify.

186) $\dfrac{10x}{\sqrt[3]{5x^2}}$ 186) _____

A) $10\sqrt[3]{x}$ B) $2\sqrt[3]{5x}$ C) $\sqrt[3]{2x}$ D) $2\sqrt[3]{25x}$

Objective: (7.5) Rationalize Denominators Containing One Term

187) $\dfrac{13x}{\sqrt{7x}}$ 187) _____

A) $13\sqrt{x}$ B) $\dfrac{13\sqrt{7x}}{49x}$ C) $\dfrac{13\sqrt{7x}}{7}$ D) $\dfrac{\sqrt{91}}{7}$

Objective: (7.5) Rationalize Denominators Containing One Term

Rationalize the denominator.

188) $\dfrac{\sqrt{5}}{\sqrt{13} + 3}$ 188) _____

A) $\dfrac{\sqrt{65} - 3\sqrt{5}}{4}$ B) $\dfrac{\sqrt{65} - 3\sqrt{5}}{16}$ C) $\dfrac{\sqrt{65} + 3\sqrt{5}}{4}$ D) $\dfrac{3\sqrt{65} + 13\sqrt{39}}{5}$

Objective: (7.5) Rationalize Denominators Containing Two Terms

Rationalize numerator.

189) $\dfrac{4 - \sqrt{5}}{2}$ 189) _____

A) $\dfrac{1}{8 + 2\sqrt{5}}$ B) $\dfrac{11}{8 + 2\sqrt{5}}$ C) $\dfrac{4}{2} - \dfrac{\sqrt{5}}{2}$ D) $\dfrac{11}{8 - 2\sqrt{5}}$

Objective: (7.5) Rationalize Numerators

190) $\dfrac{2\sqrt{x}}{\sqrt{7y}}$ 190) _____

A) $\dfrac{2x}{\sqrt{7xy}}$ B) $\dfrac{2\sqrt{7xy}}{7y}$ C) $\dfrac{2x}{\sqrt{14xy}}$ D) $\dfrac{2x}{\sqrt{7y}}$

Objective: (7.5) Rationalize Numerators

Multiply and simplify. Assume that all variables represent positive real numbers.

191) $(6\sqrt{5} + 7)^2$ 191) _____

A) $131 + 84\sqrt{5}$ B) $187 + 84\sqrt{5}$ C) $229 + 84\sqrt{5}$ D) $229 - 84\sqrt{5}$

Objective: (7.5) Use Polynomial Special Products to Multiply Radicals

Solve the equation.

192) $\sqrt{2x+3} - \sqrt{x+1} = 1$ 192) _____

A) {3} B) {3, –1} C) ∅ D) {–3, –1}

Objective: (7.6) Solve Radical Equations

193) $\sqrt{x^2-3} - \sqrt{x+3} = 0$ 193) _____

A) {–2, 3} B) ∅ C) {3} D) {3, 3}

Objective: (7.6) Solve Radical Equations

194) $\sqrt[5]{x^2\sqrt{x}} = 2$ 194) _____

A) $\{\sqrt[5]{2}\}$ B) {8} C) {4} D) {32}

Objective: (7.6) Solve Radical Equations

Solve the problem.

195) It has been found that the less income people have, the more likely they are to report that their health is fair or poor. The function $f(x) = -4.4\sqrt{x} + 38$ models the percentage of Americans reporting fair or poor health, f(x), in terms of annual income, x, in thousands of dollars. According to the model, what annual income corresponds to 15% reporting fair or poor health? Round to the nearest thousand dollars. 195) _____

A) approximately $27 thousand B) approximately $22 thousand

C) approximately $21 thousand D) approximately $30 thousand

Objective: (7.6) Use Models That are Radical Functions to Solve Problems

196) The number of centimeters, d, that a spring is compressed from its natural, uncompressed position is given by the formula $d = \sqrt{\frac{2W}{k}}$, where W is the number of joules of work done to move the spring and k is the spring constant. If a spring has a spring constant of 0.6, find the amount of work needed to move the spring 8 centimeters. 196) _____

A) 2.4 joules B) 19.2 joules C) 64 joules D) 38.4 joules

Objective: (7.6) Use Models That are Radical Functions to Solve Problems

Perform the indicated operation. Write the result in the form a + bi.

197) (3 – 4i) + (6 + 2i) 197) _____

A) –9 + 2i B) –3 + 6i C) 9 – 2i D) 9 + 2i

Objective: (7.7) Add and Subtract Complex Numbers

198) $(7 + i\sqrt{2}) + (3 - i\sqrt{98})$ 198) _____

A) $10 + 6i\sqrt{2}$ B) $10 - 6\sqrt{2}$ C) $10 - 6i\sqrt{2}$ D) $10 + 6\sqrt{2}$

Objective: (7.7) Add and Subtract Complex Numbers

Divide and simplify to the form a + bi.

199) $\frac{3+3i}{5+3i}$ 199) _____

A) $\frac{3}{4} + \frac{3}{16}i$ B) $\frac{12}{17} + \frac{3}{17}i$ C) $\frac{3}{8} + \frac{3}{16}i$ D) $\frac{6}{17} - \frac{24}{17}i$

Objective: (7.7) Divide Complex Numbers

200) $\frac{8-7i}{5-3i}$ 200) _____

A) $\frac{19}{34}+\frac{59}{34}i$ B) $\frac{19}{16}-\frac{11}{16}i$ C) $\frac{61}{16}-\frac{11}{16}i$ D) $\frac{61}{34}-\frac{11}{34}i$

Objective: (7.7) Divide Complex Numbers

Write in terms of i.

201) $\sqrt{-224}$ 201) _____

A) $-4i\sqrt{14}$ B) $4\sqrt{14}$ C) $-4\sqrt{14}$ D) $4i\sqrt{14}$

Objective: (7.7) Express Square Roots of Negative Numbers in Terms of i

202) $-\sqrt{-245}$ 202) _____

A) $7i\sqrt{5}$ B) $-7\sqrt{5}$ C) $7\sqrt{5}$ D) $-7i\sqrt{5}$

Objective: (7.7) Express Square Roots of Negative Numbers in Terms of i

Find each product. Write the result in the form a + bi.

203) $\sqrt{-25}\cdot\sqrt{-36}$ 203) _____

A) -30 B) 30 C) $30i^2$ D) $-30i$

Objective: (7.7) Multiply Complex Numbers

204) $(7-6i)(9-8i)$ 204) _____

A) $15-110i$ B) $48i^2-110i+63$ C) $15+110i$ D) $111+2i$

Objective: (7.7) Multiply Complex Numbers

Evaluate.

205) i^{26} 205) _____

A) 1 B) -1 C) $-i$ D) i

Objective: (7.7) Simplify Powers of i

Complete the square for the binomial. Then factor the resulting perfect square trinomial.

206) $x^2-\frac{2}{11}x$ 206) _____

A) $\frac{1}{121}; x^2-\frac{2}{11}x+\frac{1}{121}=\left(x-\frac{1}{11}\right)^2$ B) $\frac{2}{121}; x^2-\frac{2}{11}x+\frac{2}{121}=\left(x-\frac{1}{11}\right)^2$

C) $\frac{1}{121}; x^2-\frac{2}{11}x+\frac{1}{121}=\left(x+\frac{1}{11}\right)^2$ D) $\frac{4}{121}; x^2-\frac{2}{11}x+\frac{4}{121}=\left(x-\frac{2}{11}\right)^2$

Objective: (8.1) Complete the Square of a Binomial

Solve.

207) A 16–foot pole is supported by two wires that extend from the top of the pole to points that are each 16 feet from the base of the pole. Find the total length of the two wires. 207) _____

A) 1024 ft B) $16\sqrt{2}$ ft C) 64 ft D) $32\sqrt{2}$ ft

Objective: (8.1) Solve Problems Using the Square Root Property

208) The function $s(t) = 16t^2$ models the distance, s(t), in feet, that an object falls in t seconds. Find the number of seconds a sky diver is in free fall after jumping from a plane if she falls 1056 feet before opening a parachute. Express your answer in simplified radical form. 208) _____

A) 66 sec B) $\sqrt{66}$ sec C) 264 sec D) $16\sqrt{66}$ sec

Objective: (8.1) Solve Problems Using the Square Root Property

209) If a $5000 investment compounded to $6384.50 after 2 years, determine the annual interest rate of the investment. Use the compound interest formula $A = P(1 + r)^t$. 209) _____

A) 1.3% B) 130% C) 13% D) 1300%

Objective: (8.1) Solve Problems Using the Square Root Property

Solve the quadratic equation by completing the square.

210) $8x^2 - 5x + 1 = 0$ 210) _____

A) $\left\{\frac{5 \pm \sqrt{7}}{16}\right\}$ B) $\left\{-\frac{5}{16} \pm i\frac{\sqrt{7}}{16}\right\}$ C) $\left\{\frac{-5 \pm \sqrt{7}}{16}\right\}$ D) $\left\{\frac{5}{16} \pm i\frac{\sqrt{7}}{16}\right\}$

Objective: (8.1) Solve Quadratic Equations by Completing the Square

211) $5x^2 - 2x - 2 = 0$ 211) _____

A) $\left\{\frac{-1 \pm \sqrt{11}}{5}\right\}$ B) $\left\{\frac{5 \pm \sqrt{11}}{25}\right\}$ C) $\left\{-2, \frac{12}{5}\right\}$ D) $\left\{\frac{1 \pm \sqrt{11}}{5}\right\}$

Objective: (8.1) Solve Quadratic Equations by Completing the Square

Solve the problem.

212) If $f(x) = (x - 2)^2$, find all values of x for which $f(x) = -81$. 212) _____

A) $2 \pm 9i$ B) $-2 \pm 9i$ C) $\pm\frac{9i}{2}$ D) $2i \pm 9$

Objective: (8.1) Solve Quadratic Equations Using the Square Root Property

213) If $h(x) = \left(x - \frac{3}{2}\right)^2$, find all values of x for which $h(x) = \frac{25}{4}$. 213) _____

A) $-2, 8$ B) $-4, 1$ C) $-8, 2$ D) $-1, 4$

Objective: (8.1) Solve Quadratic Equations Using the Square Root Property

214) If $f(x) = (x - 5)^2$, find all values of x for which $f(x) = 4$. 214) _____

A) $-7, 3$ B) 9 C) 3, 7 D) 2, -2

Objective: (8.1) Solve Quadratic Equations Using the Square Root Property

Solve the equation by the method of your choice. Simplify solutions, if possible.

215) $(x + 1)(2x - 2) = 9(x - 1) - 2$ 215) _____

A) $\left\{\frac{3}{2}, 3\right\}$ B) $\left\{\frac{9 \pm 3\sqrt{17}}{4}\right\}$ C) $\left\{-3, -\frac{3}{2}\right\}$ D) $\left\{\frac{-9 \pm 3\sqrt{17}}{4}\right\}$

Objective: (8.2) Determine the Most Efficient Method to Use When Solving a Quadratic Equation

216) $(5x + 2)^2 = 7$ 216) _____

A) $\left\{-\frac{9}{5}, 1\right\}$ B) $\left\{\frac{-2 \pm \sqrt{7}}{5}\right\}$ C) $\left\{\frac{2 \pm \sqrt{7}}{5}\right\}$ D) $\left\{-\frac{2}{5} \pm i\frac{\sqrt{7}}{5}\right\}$

Objective: (8.2) Determine the Most Efficient Method to Use When Solving a Quadratic Equation

Use the quadratic formula to solve the equation.

217) $4x^2 + 8x + 2 = 0$ 217) _____

A) $\left\{\frac{-2 \pm \sqrt{2}}{2}\right\}$ B) $\left\{\frac{-8 \pm \sqrt{2}}{2}\right\}$ C) $\left\{\frac{-2 \pm \sqrt{2}}{8}\right\}$ D) $\left\{\frac{-2 \pm \sqrt{6}}{2}\right\}$

Objective: (8.2) Solve Quadratic Equations Using the Quadratic Formula

218) $x^2 + 7x + 7 = 0$ 218) _____

A) $\left\{\frac{7 \pm \sqrt{21}}{2}\right\}$ B) $\left\{\frac{-7 \pm \sqrt{21}}{2}\right\}$ C) $\left\{\frac{-7 \pm \sqrt{77}}{2}\right\}$ D) $\left\{\frac{-7 \pm \sqrt{21}}{14}\right\}$

Objective: (8.2) Solve Quadratic Equations Using the Quadratic Formula

Use the discriminant to determine the number and type of solutions for the given equation.

219) $4x^2 - 8x = 0$ 219) _____

A) two imaginary solutions B) two real irrational solutions

C) two real rational solutions D) one (repeated) real rational solution

Objective: (8.2) Use the Discriminant to Determine the Number and Type of Solutions

Solve the problem.

220) The length of a rectangular storage room is 3 feet longer than its width. If the area of the room is 70 square feet, find its dimensions. 220) _____

A) 6 ft by 9 ft B) 8 ft by 11 ft C) 7 ft by 10 ft D) 6 ft by 11 ft

Objective: (8.2) Use the Quadratic Formula to Solve Problems

221) A ball is thrown upward with an initial velocity of 21 meters per second from a cliff that is 60 meters high. The height of the ball is given by the quadratic equation $h = -4.9t^2 + 21t + 120$ where h is in meters and t is the time in seconds since the ball was thrown. Find the time that the ball will be 60 meters from the ground. Round your answer to the nearest tenth of a second. 221) _____

A) 7.6 sec B) 7.5 sec C) 6.3 sec D) 6.2 sec

Objective: (8.2) Use the Quadratic Formula to Solve Problems

Write a quadratic equation in standard form with the given solution set.

222) {–10i, 10i} 222) _____

A) $x^2 + 20x + 100 = 0$ B) $x^2 + 100 = 0$

C) $x^2 - 100 = 0$ D) $x^2 - 20x - 100 = 0$

Objective: (8.2) Write Quadratic Equations from Solutions

223) {–3, 6} 223) _____

A) $x^2 + 18x + 3 = 0$ B) $x^2 + 3x - 18 = 0$ C) $x^2 - 18x + 3 = 0$ D) $x^2 - 3x - 18 = 0$

Objective: (8.2) Write Quadratic Equations from Solutions