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

Solve the equation.

1) \(5(y + 2) = 6(y - 7)\)
   - A) 52
   - B) -52
   - C) -32
   - D) 32
   1) _____
   Objective: (3.3) Solve Linear Equations Containing Parentheses

Solve.

2) \(\frac{x}{5} = \frac{x}{6} + \frac{2}{5}\)
   - A) 12
   - B) \(-\frac{2}{5}\)
   - C) 0
   - D) \(\frac{1}{12}\)
   2) _____
   Objective: (4.8) Solve Equations Containing Fractions

Solve the equation.

3) \(1.1x + 4.3 = 0.7x + 1.14\)
   - A) -7.9
   - B) -7.8
   - C) 0.127
   - D) -7.11
   3) _____
   Objective: (5.6) Solve Equations Containing Decimals

4) \(5(x - 1.2) = 9.3\)
   - A) 3.06
   - B) 1.62
   - C) 2.1
   - D) 15.3
   4) _____
   Objective: (5.6) Solve Equations Containing Decimals

5) \(8(3x - 0.2) = 7x - 1.6\)
   - A) 0
   - B) 0.188
   - C) -0.082
   - D) 17
   5) _____
   Objective: (5.6) Solve Equations Containing Decimals

Solve the proportion.

6) \(\frac{4}{13} = \frac{x}{39}\)
   - A) 12
   - B) \(\frac{1}{3}\)
   - C) \(12\frac{3}{4}\)
   - D) 16
   6) _____
   Objective: (6.1) Solve Proportions

Solve.

7) The scale on a map states that 1 centimeter corresponds to 40 kilometers. On the map, two cities are 21 cm apart. Find the actual distance.
   - A) 840 km
   - B) 84 km
   - C) 8400 km
   - D) 84,000 km
   7) _____
   Objective: (6.1) Solve Problems Modeled by Proportions
Find the total amount in the compound interest account.
8) $18,000 at 5% compounded annually for 5 years
   A) $22,973.07  B) $21,879.11  C) $21,600.00  D) $22,500.00
Objective: (6.7) Calculate Compound Interest

Solve the equation.
9) 9x + 5 - 9x - 5 = 6x - 6x - 3
   A) 0  B) -288  C) all real numbers  D) no solution
Objective: (9.3) Recognize Identities and Equations with No Solution

10) 2(x + 5) = (2x + 10)
    A) 20  B) 0  C) all real numbers  D) no solution
Objective: (9.3) Recognize Identities and Equations with No Solution

Solve.
11) You have taken up gardening for relaxation and have decided to fence in your new rectangular shaped masterpiece. The length of the garden is 12 meters and 46 meters of fencing is required to completely enclose it. What is the width of the garden?
    A) 11 m  B) 552 m  C) 3.83 m  D) 22 m
Objective: (9.5) Use Formulas to Solve Problems

Solve the equation for the indicated variable.
12) A = P + PRT for T
    A) T = \frac{A - P}{PR}  B) T = \frac{P - A}{PR}  C) T = \frac{A}{R}  D) T = \frac{PR}{A - P}
Objective: (9.5) Solve a Formula or Equation for One of Its Variables

Solve the inequality.
13) -7x - 8 ≤ -8x - 13
    A) (-∞, -5]  B) [-5, ∞)
    C) (-∞, -7)  D) (-7, ∞)
Objective: (9.6) Use the Addition Property of Inequality to Solve Inequalities
14) \( \frac{y}{2} \geq 4 \)

A) \([8, \infty)\)

B) \((\infty, 8)\)

C) \((\infty, 8]\)

D) \((8, \infty)\)

Objective: (9.6) Use the Multiplication Property of Inequality to Solve Inequalities

Solve the inequality. Graph the solution set and write it in interval notation.

15) \(-2(3x + 14) < -8x - 16\)

A) \((\infty, 6)\)

B) \((\infty, 6]\)

C) \([6, \infty)\)

D) \((6, \infty)\)

Objective: (9.6) Use Both Properties to Solve Inequalities
16) \(-16x - 32 \leq -4(3x + 3)\)

A) \([-5, \infty)\)

B) \((-\infty, -5)\)

C) \((-\infty, -5]\)

D) \((-5, \infty)\)

Objective: (9.6) Use Both Properties to Solve Inequalities

Solve.

17) The area of a rectangle must be at least 84 square feet. If the length is 7 feet, find the minimum for the rectangle's width.

A) 12 ft  B) 35 ft  C) 13 ft  D) \(\frac{1}{12}\) ft

Objective: (9.6) Solve Problems Modeled by Inequalities

Find three ordered pair solutions by completing the table. Then use the ordered pairs to graph the equation.

18) \(y = 2x + 4\)
Objective: (10.2) Graph a linear equation by finding and plotting ordered pair solutions.

19) \( y = -2x - 4 \)
Objective: (10.2) Graph a linear equation by finding and plotting ordered pair solutions.

Graph the linear equation.
20) $5y - 25x = 10$

Objective: (10.2) Graph a linear equation by finding and plotting ordered pair solutions.
Objective: (10.2) Graph a linear equation by finding and plotting ordered pair solutions.
22) $y = -7$

Objective: (10.2) Graph a linear equation by finding and plotting ordered pair solutions.
Objective: (10.2) Graph a linear equation by finding and plotting ordered pair solutions.
Identify the intercepts.

24) __________

A) (1, 0), (0, 3)  B) (-1, 0), (0, 3)  C) (1, 0), (0, -3)  D) (-3, 0), (0, 3)

Objective: (10.3) Identify intercepts of a graph.

Graph the linear equation by finding and plotting its intercepts.

25) -x + 4y = -4

A) __________

B) __________

25) ___
Objective: (10.3) Graph a linear equation by finding and plotting intercepts.

26) \(-5x - y = -10\)
Objective: (10.3) Graph a linear equation by finding and plotting intercepts.

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

27) (8, 5) and (6, 9)
   A) −2
   B) \( \frac{1}{2} \)
   C) 1
   D) 2

Objective: (10.4) Find the slope of a line given two points of the line.

28) (−6, 9) and (−1, 6)
   A) \( \frac{-3}{5} \)
   B) \( \frac{-5}{3} \)
   C) \( \frac{-15}{7} \)
   D) \( \frac{3}{5} \)

Find the slope of the line.

29) \( y = -7x - 8 \)
   A) \( m = -7 \)
   B) \( m = -8 \)
   C) \( m = 7 \)
   D) \( m = -\frac{1}{7} \)

Objective: (10.4) Find the slope of a line given its equation.

30) \( 8x - 5y = 40 \)
   A) \( m = \frac{8}{5} \)
   B) \( m = -\frac{8}{5} \)
   C) \( m = \frac{5}{8} \)
   D) \( m = 8 \)

Objective: (10.4) Find the slope of a line given its equation.

Determine whether the pair of lines is parallel, perpendicular, or neither.

31) \( y = -5x + 1 \)
    \( y = 5x - 8 \)
   A) parallel
   B) perpendicular
   C) neither

Objective: (10.4) Compare the slopes of parallel and perpendicular lines.

32) \( y = \frac{5}{2}x + 2 \)
    \( y = -\frac{2}{5}x + 5 \)
   A) parallel
   B) perpendicular
   C) neither

Objective: (10.4) Compare the slopes of parallel and perpendicular lines.
33) \[ y = 4x + 4 \]
\[ x - 4y = 8 \]
A) parallel    B) perpendicular    C) neither

Objective: (10.4) Compare the slopes of parallel and perpendicular lines.

Find the slope of the line and write the slope as a rate of change. Don’t forget to attach the proper units.
34) The graph shows the total cost \( y \) (in dollars) of owning and operating a mini-van where \( x \) is the number of miles driven.

<table>
<thead>
<tr>
<th>( x )</th>
<th>( y )</th>
</tr>
</thead>
<tbody>
<tr>
<td>3000</td>
<td>1166.7</td>
</tr>
<tr>
<td>7000</td>
<td>2722.2</td>
</tr>
</tbody>
</table>

A) $0.39$ per mile  B) $2.57$ per mile  C) $25.00$ per mile  D) cannot be determined

Objective: (10.4) Use slope as a rate of change.

Write an equation of the line with the given slope, \( m \), and \( y \)-intercept \((0, \ b)\).
35) \( m = -8, \ b = -2 \)
A) \( y = -8x - 2 \)  B) \( y = -2x - 8 \)  C) \( y = 8x + 2 \)  D) \( y = 2x + 8 \)

Objective: (10.5) Use the slope-intercept form to write the equation of a line.

Find an equation of the line with the given slope that passes through the given point. Write the equation in the form \( Ax + By = C \).
36) \( m = 3; \ (5, \ 9) \)
A) \( 3x - y = 6 \)  B) \( 3x - y = 22 \)  C) \( 3x - y = -9 \)  D) \( 3x - y = -24 \)

Objective: (10.5) Use the point-slope form to find an equation of a line given its slope and a point of the line.

Find an equation of the line described. Write the equation in slope-intercept form if possible.
37) Slope 2, through \((5, \ 2)\)
A) \( y = 2x - 8 \)  B) \( y = 2x + 8 \)  C) \( x = 2y - 8 \)  D) \( x = 2y + 8 \)

Objective: (10.5) Use the point-slope form to find an equation of a line given its slope and a point of the line.
Find an equation of the line through the pair of points. Write the equation in the form $Ax + By = C$.

38) \((-6, 3)\) and \((0, -2)\)

A) $-5x - 6y = 12$  
B) $5x - 6y = 12$  
C) $9x - 2y = -4$  
D) $-9x + 2y = -4$

Objective: (10.5) Use the point-slope form to find an equation given two points of the line.

Evaluate the function.

39) Find $f(4)$ when $f(x) = x^2 + 4x - 3$.

A) 29  
B) 35  
C) 3  
D) -3

Objective: (10.6) Use function notation.

40) Find $f(7)$ when $f(x) = 9x - 9$.

A) 54  
B) 72  
C) 55  
D) 0

Objective: (10.6) Use function notation.

41) Find $f(19)$ when $f(x) = |x - 1|$.

A) 18  
B) -20  
C) 20  
D) -18

Objective: (10.6) Use function notation.

Find the domain and range of the function graphed.

42)

A) domain: $(-\infty, \infty)$; range: $(-\infty, \infty)$  
B) domain: $(-\infty, \infty)$; range: \{3\}

C) domain: \(\left\{\frac{1}{2}\right\}\); range: $(-\infty, \infty)$  
D) domain: \(\left\{\frac{1}{2}\right\}\); range: \{3\}

Objective: (10.6) Use function notation.
43) A) domain: \((-\infty, \infty)\); range: \([4]\)  
B) domain: \((-\infty, \infty)\); range: \((-\infty, \infty)\)  
C) domain: \((-\infty, \infty)\); range: \((-\infty, 4) \cup (4, \infty)\)  
D) domain: \((-\infty, 4) \cup (4, \infty)\); range: \((-\infty, \infty)\)  

Objective: (10.6) Use function notation.

44) A) domain: \((-\infty, \infty)\); range: \([-4, \infty)\)  
B) domain: \([-5, \infty)\); range: \([-4, \infty)\)  
C) domain: \((-\infty, \infty)\); range: \((-\infty, \infty)\)  
D) domain: \((-\infty, -5) \cup (-5, \infty)\); range: \((-\infty, -4) \cup (-4, \infty)\)  

Objective: (10.6) Use function notation.
Determine whether the ordered pair is a solution of the system of linear equations.

46) \((-3, 3);\)
\[
\begin{align*}
x + y &= 0 \\
x - y &= -6
\end{align*}
\]
A) Yes \hspace{1cm} \text{B) No}

Objective: (11.1) Determine if an ordered pair is a solution of a system of equations in two variables.

47) \((3, -4);\)
\[
\begin{align*}
3x + y &= 5 \\
4x + 3y &= 0
\end{align*}
\]
A) Yes \hspace{1cm} \text{B) No}

Objective: (11.1) Determine if an ordered pair is a solution of a system of equations in two variables.

48) \((-3, 5);\)
\[
\begin{align*}
4x + y &= -17 \\
2x + 4y &= -26
\end{align*}
\]
A) Yes \hspace{1cm} \text{B) No}

Objective: (11.1) Determine if an ordered pair is a solution of a system of equations in two variables.
Solve the system of equations by graphing.

49) \[
\begin{align*}
y &= x - 3 \\
y &= 2x - 1
\end{align*}
\]

- A) \((-2, -5)\)
- B) \((-5, -2)\)
- C) \((2, 5)\)
- D) no solution

Objective: (11.1) Solve a system of linear equations by graphing.

50) \[
\begin{align*}
x + y &= -3 \\
x + y &= -4
\end{align*}
\]

- A) no solution
- B) \((-2, -1)\)
- C) \((-2, -2)\)
- D) \((-4, 1)\)

Objective: (11.1) Solve a system of linear equations by graphing.

Solve the system of equations by the substitution method.

51) \[
\begin{align*}
x + y &= 56 \\
y &= -9x
\end{align*}
\]

- A) \((-7, 63)\)
- B) \((63, -7)\)
- C) infinite number of solutions
- D) no solution

Objective: (11.2) Use the substitution method to solve a system of linear equations.

52) \[
\begin{align*}
y &= 4x - 1 \\
4y - 20x &= -24
\end{align*}
\]

- A) \((5, 19)\)
- B) \((19, 5)\)
- C) infinite number of solutions
- D) no solution

Objective: (11.2) Use the substitution method to solve a system of linear equations.
53) \[
\begin{align*}
5x + 5y &= -1 \\
-4x + 4y &= -44
\end{align*}
\]
A) (9, -2)  
B) (8, -1)  
C) (-9, -1)  
D) no solution

Objective: (11.2) Use the substitution method to solve a system of linear equations.

54) \[
\begin{align*}
-2x + y &= -10 \\
-3x + 3y &= -18
\end{align*}
\]
A) (4, -2)  
B) (5, -3)  
C) (-2, 4)  
D) no solution

Objective: (11.2) Use the substitution method to solve a system of linear equations.

55) \[
\begin{align*}
3x + y &= 9 \\
9x + 3y &= 27
\end{align*}
\]
A) infinite number of solutions  
B) (0, 9)  
C) (5, -6)  
D) no solution

Objective: (11.2) Use the substitution method to solve a system of linear equations.

56) \[
\begin{align*}
-6x - 24y &= 7 \\
2x + 8y &= 0
\end{align*}
\]
A) no solution  
B) (0, 7)  
C) (7, 0)  
D) infinite number of solutions

Objective: (11.2) Use the substitution method to solve a system of linear equations.

Solve the system of equations by the addition method.

57) \[
\begin{align*}
5x + y &= -58 \\
5x - y &= 8
\end{align*}
\]
A) (-5, -33)  
B) (-33, -5)  
C) infinite number of solutions  
D) no solution

Objective: (11.3) Use the addition method to solve a system of linear equations.

58) \[
\begin{align*}
x - 7y &= -66 \\
-6x - 8y &= -54
\end{align*}
\]
A) (-3, 9)  
B) (-4, 10)  
C) (3, 10)  
D) no solution

Objective: (11.3) Use the addition method to solve a system of linear equations.

59) \[
\begin{align*}
3x + 7y &= -13 \\
7x + 3y &= 23
\end{align*}
\]
A) (5, -4)  
B) (-5, 4)  
C) (5, 4)  
D) (-5, -4)

Objective: (11.3) Use the addition method to solve a system of linear equations.

Without actually solving the problem, choose the correct solution by deciding which choice satisfies the given conditions.

60) Jorge has a total of 50 coins, all of which are either dimes or nickels. The total value of the coins is $4.15. Find the number of each type of coin.
A) 17 nickels; 33 dimes  
B) 19 nickels; 31 dimes  
C) 22 nickels; 28 dimes  
D) 33 nickels; 17 dimes

Objective: (11.5) Solve problems that can be modeled by a system of two linear equations.
Solve.

61) Devon purchased tickets to an air show for 8 adults and 2 children. The total cost was $158. The cost of a child’s ticket was $6 less than the cost of an adult’s ticket. Find the price of an adult’s ticket and a child’s ticket.

A) adult’s ticket: $17; child’s ticket: $11
B) adult’s ticket: $18; child’s ticket: $12
C) adult’s ticket: $16; child’s ticket: $10
D) adult’s ticket: $19; child’s ticket: $13

Objective: (11.5) Solve problems that can be modeled by a system of two linear equations.

62) University Theater sold 579 tickets for a play. Tickets cost $22 per adult and $11 per senior citizen. If total receipts were $8503, how many senior citizen tickets were sold?

A) 385 senior citizen tickets
B) 194 senior citizen tickets
C) 295 senior citizen tickets
D) 284 senior citizen tickets

Objective: (11.5) Solve problems that can be modeled by a system of two linear equations.

63) A vendor sells hot dogs and bags of potato chips. A customer buys 3 hot dogs and 5 bags of potato chips for $13.00. Another customer buys 5 hot dogs and 2 bags of potato chips for $13.75. Find the cost of each item.

A) $2.25 for a hot dog; $1.25 for a bag of potato chips
B) $1.25 for a hot dog; $2.25 for a bag of potato chips
C) $2.50 for a hot dog; $1.50 for a bag of potato chips
D) $2.25 for a hot dog; $1.50 for a bag of potato chips

Objective: (11.5) Solve problems that can be modeled by a system of two linear equations.

Use the power rule and the power of a product or quotient rule to simplify the expression.

64) \((4x^3y^3)^2\)

A) 16x^6y^6
B) 4x^5y^5
C) 4x^6y^6
D) 16x^5y^5

Objective: (12.1) Use the power rules for products and quotients.

Use the quotient rule to simplify the expression.

65) \(\frac{45m^3n^7}{9m^2n^5}\)

A) 5mn^2
B) 45mn^2
C) 5m^5n^{12}
D) 5n^2

Objective: (12.1) Use the quotient rule for exponents.

Multiply.

66) \(7x^3(-2x^2)\)

A) -14x^5
B) 14x^5
C) -14x^6
D) 14x^6

Objective: (12.3) Multiply monomials.

67) \((a + 8)(a + 1)\)

A) a^2 + 9a + 8
B) a^2 + 9a + 9
C) 2a^2 + 8
D) 2a + 8

Objective: (12.3) Use the distributive property to multiply polynomials.

68) \((x - 4)(x - 6)\)

A) x^2 - 10x + 24
B) x^2 + 10x - 24
C) 2x^2 - 24
D) 2x + 24

Objective: (12.3) Use the distributive property to multiply polynomials.
69) \((9z + 11)^2\)  
   A) \(81z^2 + 198z + 121\)  
   B) \(81z^2 + 121\)  
   C) \(9z^2 + 198z + 121\)  
   D) \(9z^2 + 121\)

Objective: (12.3) Use the distributive property to multiply polynomials.

70) \((x + 12)(x^3 + 2x - 5)\)  
   A) \(x^4 + 12x^3 + 2x^2 + 19x - 60\)  
   B) \(x^3 + 14x^2 + 19x - 60\)  
   C) \(x^4 + 2x^2 - 5x + 12\)  
   D) \(x^4 + 12x^3 + 2x^2 + 29x + 60\)

Objective: (12.3) Use the distributive property to multiply polynomials.

71) \((8x - 1)(x^2 - 3x + 1)\)  
   A) \(8x^3 - 25x^2 + 11x - 1\)  
   B) \(8x^3 - 23x^2 + 5x - 1\)  
   C) \(8x^3 - 24x^2 + 8x + 1\)  
   D) \(8x^3 + 25x^2 - 11x + 1\)

Objective: (12.3) Use the distributive property to multiply polynomials.

Solve.

72) Find the volume of the rectangular solid. Express the volume as a product, then multiply and simplify.

\[
\begin{array}{c}
\text{Volume:} \\
7 - 3x & 9 - 3x \\
\end{array}
\]

A) \(9x^3 - 48x^2 + 63x\)  
B) \(9x^2 - 48x + 64\)  
C) \(-9x^3 + 36x^2 + 63x\)  
D) \(-9x^2 + 36x + 64\)

Objective: (12.3) Use the distributive property to multiply polynomials.

Multiply.

73) \((3a - 7)^2\)  
   A) \(9a^2 - 42a + 49\)  
   B) \(9a^2 - 49\)  
   C) \(3a^2 - 42a + 49\)  
   D) \(3a^2 + 49\)

Objective: (12.4) Square a binomial.

74) \((a - 1)(a + 1)\)  
   A) \(a^2 - 1\)  
   B) \(a^2 - 2\)  
   C) \(a^2 - 2a - 1\)  
   D) \(a^2 + 2a - 1\)

Objective: (12.4) Multiply the sum and difference of two terms.

Simplify the expression. Write the result using positive exponents only.

75) \[
\frac{2^{-7}x^{-5}y^3}{2^{-4}x^{-8}y^6}
\]

A) \(\frac{x^3}{8y^3}\)  
B) \(\frac{1}{8x^8y^3}\)  
C) \(\frac{3x^3}{y^3}\)  
D) \(\frac{8}{x^3y^3}\)

Objective: (12.5) Use all the rules and definitions for exponents to simplify exponential expressions.
Perform the division.

76) \[
\begin{array}{c}
-12x^{10} - 9x^7 \\
-3x^4 \\
\end{array}
\]
A) \(4x^6 + 3x^3\)  
B) \(4x^6 - 9x^7\)  
C) \(-12x^{10} + 3x^3\)  
D) \(7x^{13}\)

Objective: (12.6) Divide a polynomial by a monomial.

Factor out the GCF from the polynomial.

77) \(30x + 10\)
A) \(10(3x + 1)\)  
B) \(5(6x + 2)\)  
C) \(2(15x + 5)\)  
D) \(10(3x)\)

Objective: (13.1) Factor out the greatest common factor from a polynomial.

78) \(21x^3 - 6x^2 + 12x\)
A) \(3x(7x^2 - 2x + 4)\)  
B) \(3(7x^3 - 2x^2 + 4x)\)  
C) \(x(21x^2 - 6x + 12)\)  
D) \(3x(7x^3 - 2x^2 + 4x)\)

Objective: (13.1) Factor out the greatest common factor from a polynomial.

79) \(20x^4y + 36xy^3\)
A) \(4xy(5x^3 + 9y^2)\)  
B) \(xy(20x^3 + 36y^2)\)  
C) \(4x(5x^3y + 9y^3)\)  
D) \(4y(5x^4 + 9xy^2)\)

Objective: (13.1) Factor out the greatest common factor from a polynomial.

Factor the four-term polynomial by grouping.

80) \(2x + 24 + xy + 12y\)
A) \((x + 12)(2 + y)\)  
B) \((y + 12)(x + 2)\)  
C) \((x + 12y)(2 + y)\)  
D) \((y + 12)(2x + y)\)

Objective: (13.1) Factor a polynomial by grouping.

81) \(xy + 11x - 8y - 88\)
A) \((y + 11)(x - 8)\)  
B) \((y - 11)(x + 8)\)  
C) \((x - 11)(y + 8)\)  
D) \((x + 11)(y - 8)\)

Objective: (13.1) Factor a polynomial by grouping.

Factor the trinomial completely. If the polynomial cannot be factored, write "prime."

82) \(x^2 - x - 42\)
A) \((x + 6)(x - 7)\)  
B) \((x - 6)(x + 7)\)  
C) \((x + 1)(x - 42)\)  
D) prime

Objective: (13.2) Factor trinomials of the form \(x^2 + bx + c\).

83) \(x^2 + x - 30\)
A) \((x - 5)(x + 6)\)  
B) \((x - 6)(x + 5)\)  
C) \((x + 1)(x - 30)\)  
D) prime

Objective: (13.2) Factor trinomials of the form \(x^2 + bx + c\).

84) \(x^2 - 3x - 88\)
A) \((x - 11)(x + 8)\)  
B) \((x + 11)(x - 8)\)  
C) \((x - 88)(x + 1)\)  
D) prime

Objective: (13.2) Factor trinomials of the form \(x^2 + bx + c\).

85) \(3x - 10 + x^2\)
A) \((x + 5)(x - 2)\)  
B) \((x - 5)(x + 2)\)  
C) \((x - 5)(x + 1)\)  
D) prime

Objective: (13.2) Factor trinomials of the form \(x^2 + bx + c\).
Factor the binomial completely.

86) $z^2 - 121$
   A) $(z + 11)(z - 11)$  B) $(z + 11)^2$  C) $(z - 11)^2$  D) prime

Objective: (13.5) Factor the difference of two squares.

87) $81x^2 - 49$
   A) $(9x + 7)(9x - 7)$  B) $(9x - 7)^2$  C) $(9x + 7)^2$  D) prime

Objective: (13.5) Factor the difference of two squares.

Solve the equation.

88) $(x - 6)(x + 4) = 0$
   A) 6, -4  B) -6, 4  C) 6, -6, 4, -4  D) 6, 4

Objective: (13.6) Solve quadratic equations by factoring.

89) $(2x + 1)(5x - 3) = 0$
   A) $-\frac{1}{2}, \frac{3}{5}$  B) $\frac{1}{2}, -\frac{3}{5}$  C) 1, 2  D) 2, $\frac{5}{3}$

Objective: (13.6) Solve quadratic equations by factoring.

90) $x^2 + 2x - 80 = 0$
   A) -10, 8  B) 10, 8  C) -10, 1  D) 10, -8

Objective: (13.6) Solve quadratic equations by factoring.

91) $x^2 - 7x - 18 = 0$
   A) 9, -2  B) -9, 2  C) -9, -2  D) -18, 0

Objective: (13.6) Solve quadratic equations by factoring.

92) $x^2 + 8x + 12 = 0$
   A) -6, -2  B) 6, 2  C) 6, -2  D) 12, 0

Objective: (13.6) Solve quadratic equations by factoring.

93) $x^2 - x = 72$
   A) -8, 9  B) 8, 9  C) 1, 72  D) -8, -9

Objective: (13.6) Solve quadratic equations by factoring.

94) $2x^2 - 7x - 9 = 0$
   A) $\frac{9}{2}, -1$  B) $\frac{2}{9}, -1$  C) $\frac{2}{9}, 1$  D) $\frac{2}{9}, 0$

Objective: (13.6) Solve quadratic equations by factoring.

95) $15x^2 - 8x = 0$
   A) $\frac{8}{15}, 0$  B) $\frac{15}{8}, 0$  C) $-\frac{8}{15}, 0$  D) $-\frac{15}{8}, 0$

Objective: (13.6) Solve quadratic equations by factoring.
96) \(3x^2 + 21x + 36 = 0\)  
A) \(-4, -3\)  
B) \(-\frac{1}{2}, \frac{1}{2}\)  
C) \(3, 4\)  
D) \(7, 8\)  

Objective: (13.6) Solve quadratic equations by factoring.  
m50-10

97) \(10x^3 + 70x^2 + 120x = 0\)  
A) \(0, -3, -4\)  
B) \(-3, -4\)  
C) \(0, 3, 4\)  
D) \(-\frac{1}{3}, -4\)  

Objective: (13.6) Solve equations with degree greater than 2 by factoring.  
m50-12

98) \(9x^3 - 16x = 0\)  
A) \(\frac{4}{3}, -\frac{4}{3}, 0\)  
B) \(\frac{4}{3}\)  
C) \(-\frac{4}{3}\)  
D) \(\frac{4}{3}, -\frac{4}{3}\)  

Objective: (13.6) Solve equations with degree greater than 2 by factoring.  
m50-15

Find the product and simplify.

99) \(\frac{z^3}{20z} \cdot \frac{5}{2z^2}\)  
A) \(\frac{1}{8}\)  
B) \(\frac{1}{8z}\)  
C) \(\frac{z}{8}\)  
D) \(\frac{z^3}{8z^2}\)  

Objective: (14.2) Multiply rational expressions.  
m50-11

100) \(\frac{2y}{4y + 2} \cdot \frac{10y + 5}{7}\)  
A) \(\frac{5y}{7}\)  
B) \(\frac{5}{7}\)  
C) \(\frac{5y}{14}\)  
D) \(\frac{y}{7}\)  

Objective: (14.2) Multiply rational expressions.  
m50-17

Find the quotient and simplify.

101) \(\frac{2x^{13}}{7x^6} \div \frac{4x}{14x^3}\)  
A) \(x^9\)  
B) \(\frac{4x^5}{49}\)  
C) \(\frac{2x^9}{7}\)  
D) \(\frac{8x^5}{98}\)  

Objective: (14.2) Divide rational expressions.  
m50-18

102) \(\frac{x^2 - y^2}{x + y} \div \frac{x}{x^2 - xy}\)  
A) \((x - y)^2\)  
B) \((x + y)\)  
C) \((x + y)^2\)  
D) \((x - y)(x + y)\)  

Objective: (14.2) Divide rational expressions.  
m50-18
Perform the indicated operation. Simplify if possible.

\[
\frac{x^2 - 8x}{x - 6} + \frac{12}{x - 6}
\]

A) \(x - 2\)  
B) \(x + 6\)  
C) \(x + 2\)  
D) \(x - 6\)

103) _____

Objective: (14.3) Add and subtract rational expressions with the same denominator.

Graph the linear function.

104) \(f(x) = -\frac{5}{6}x + 2\)

104) _____

A) 
B) 
C) 
D) 

Objective: (15.1) Graph linear functions.
Match the linear function with its graph.

105) \( f(x) = -3x + 9 \)

A) [Graph 1]

B) [Graph 2]

C) [Graph 3]

D) [Graph 4]

Objective: (15.1) Graph linear functions.

Find an equation of the line. Write the equation using function notation.

106) Through (8, 5); parallel to \( f(x) = 5x - 6 \)

A) \( f(x) = 5x - 35 \)  
B) \( f(x) = 5x + 45 \)  
C) \( f(x) = 5x + 5 \)  
D) \( f(x) = -5x - 35 \)

Objective: (15.1) Find equations of parallel and perpendicular lines.

107) Through (2, 4); perpendicular to \( f(x) = -3x + 4 \)

A) \( f(x) = \frac{1}{3}x + \frac{10}{3} \)  
B) \( f(x) = -\frac{1}{3}x + \frac{10}{3} \)

C) \( f(x) = 3x + \frac{10}{3} \)  
D) \( f(x) = -3x + \frac{10}{3} \)

Objective: (15.1) Find equations of parallel and perpendicular lines.

Graph the function.
108) \( f(x) = x^2 + 5 \)

Objective: (15.2) Graph nonlinear functions.
109) \( f(x) = \sqrt{x} + 5 \)

Objective: (15.2) Graph nonlinear functions.
110) \( f(x) = -x^2 \)

**Objective:** (15.3) Reflect graphs.

If \( y \) varies directly as \( x \), find the direct variation equation for the situation.

111) \( y = 3 \) when \( x = 21 \)

A) \( y = \frac{1}{7}x \)  
B) \( y = 7x \)  
C) \( y = x + 18 \)  
D) \( y = \frac{1}{3}x \)

**Objective:** (15.4) Solve problems involving direct variation.
112) The amount of water used to take a shower is directly proportional to the amount of time that the shower is in use. A shower lasting 23 minutes requires 18.4 gallons of water. Find the amount of water used in a shower lasting 7 minutes.

A) 5.6 gallons  
B) 161 gallons  
C) 4.8 gallons  
D) 6.4 gallons

Objective: (15.4) Solve problems involving direct variation.

Solve the compound inequality. Graph the solution set.

113) \(13 \leq 4t + 5 \leq 29\)

A) [2, 6]  
B) (2, 6)  
C) [-6, -2]  
D) (-6, -2)

Objective: (16.1) Solve compound inequalities containing “and.”

Solve the absolute value equation.

114) \(|x + 3| = 6\)

A) -9, 3  
B) 9, 3  
C) -3  
D) \(\emptyset\)

Objective: (16.2) Solve absolute value equations.

Solve the inequality. Graph the solution set.

115) \(|x + 18| < 9\)

A) (-27, -9)  
B) (9, 27)  
C) \((-\infty, -9)\)  
D) \((-\infty, -27)\)

Objective: (16.3) Solve absolute value inequalities of the form \(|X| < a\).
116) \(|x + 3| > 4\)
    A) \((-\infty, -7) \cup (1, \infty)\)
    B) \((-1, 7)\)
    C) \((-7, 1)\)
    D) \((1, \infty)\)

Objective: (16.3) Solve absolute value inequalities of the form \(|X| > a\).

Determine whether the ordered pair given is a solution of the linear inequality in two variables.

117) \(2x + 3y \leq -6; \ (3, 4)\)
    A) Yes  B) No

Objective: (16.4) Determine whether an ordered pair is a solution of a linear inequality in two variables.

118) \(x + 2y > -3; \ (4, -3)\)
    A) Yes  B) No

Graph the inequality.

119) \(x + y \leq -2\)
Objective: (16.4) Graph a linear inequality in two variables.

Find the square root. Assume that all variables represent positive real numbers.

120) \( \sqrt{16x^{10}} \)

A) \( 4x^5 \)  
B) \( 4x^{10} \)  
C) \( 16x^5 \)  
D) \( 4x^2 \)

Objective: (17.1) Find square roots.  
m50–24

Use radical notation to write the expression. Simplify if possible.

121) \( 256^{1/4} \)

A) 4  
B) 16  
C) 64  
D) 1024

Objective: (17.2) Understand the meaning of \( a^{1/n} \).  
m50–27

122) \( (243x^{25})^{1/5} \)

A) \( 3x^5 \)  
B) \( 243x^5 \)  
C) \( 3x^{25} \)  
D) \( 3 \sqrt[5]{x} \)

Objective: (17.2) Understand the meaning of \( a^{1/n} \).

Simplify the radical expression. Assume that all variables represent positive real numbers.

123) \( \sqrt{20} \)

A) \( 2\sqrt{5} \)  
B) \( 5\sqrt{2} \)  
C) 10  
D) 4

Objective: (17.3) Simplify radicals.
124) \(\sqrt{275}\)  
A) 5\(\sqrt{11}\)  
B) \(\sqrt{275}\)  
C) 55  
D) 25\(\sqrt{11}\)  
Objective: (17.3) Simplify radicals.

125) \(\sqrt{320k^7q^8}\)  
A) 8\(k^3q^4\)\(\sqrt{5k}\)  
B) 8\(k^3q^4\)\(\sqrt{5}\)  
C) 8\(k^3q^4\)\(\sqrt{5}\)  
D) 8\(q^4\)\(\sqrt{5k^7}\)  
Objective: (17.3) Simplify radicals.

126) \(\frac{3}{\sqrt{512x^4y^5}}\)  
A) 8\(xy\)\(\frac{3}{\sqrt{xy^2}}\)  
B) 5\(xy\)\(\frac{3}{\sqrt{xy^2}}\)  
C) 8\(xy\)\(\frac{3}{\sqrt{xy}}\)  
D) 8\(xy\)\(\frac{3}{\sqrt{xy^2}}\)  
Objective: (17.3) Simplify radicals.

Add or subtract. Assume all variables represent positive real numbers.

127) \(\sqrt{20} - \sqrt{245}\)  
A) -5\(\sqrt{5}\)  
B) 9\(\sqrt{5}\)  
C) -25  
D) -5\(\sqrt{10}\)  
Objective: (17.4) Add or subtract radical expressions.

Rationalize the denominator and simplify. Assume that all variables represent positive real numbers.

128) \(\frac{\sqrt{5} - \sqrt{6}}{\sqrt{5} + \sqrt{6}}\)  
A) 2\(\sqrt{30} - 11\)  
B) 11 - 2\(\sqrt{30}\)  
C) 11 + 2\(\sqrt{30}\)  
D) -11 - 2\(\sqrt{30}\)  
Objective: (17.5) Rationalize denominators having two terms.

Rationalize the numerator and simplify. Assume all variables represent positive real numbers.

129) \(\frac{5 + \sqrt{6}}{5 - \sqrt{6}}\)  
A) \(\frac{19}{31 - 10\sqrt{6}}\)  
B) \(\frac{19}{31 + 10\sqrt{6}}\)  
C) 1  
D) \(\frac{31}{19 - 10\sqrt{6}}\)  
Objective: (17.5) Rationalize numerators.

Solve.

130) \(\sqrt{x} + 4 = 8\)  
A) 60  
B) 64  
C) 68  
D) 144  
Objective: (17.6) Solve equations that contain radical expressions.

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

131) \(\frac{8 + 7i}{9 - 2i}\)  
A) \(\frac{58 + 79i}{85}\)  
B) \(\frac{58 - 79i}{77}\)  
C) \(\frac{86 - 47i}{85}\)  
D) \(\frac{86 - 79i}{77}\)  
Objective: (17.7) Divide complex numbers.
Use the square root property to solve the equation.

132) \((x - 5)^2 = 36\)
   A) 11, -1  B) -1, -11  C) 6, -6  D) 41

Objective: (18.1) Use the square root property to solve quadratic equations.

Solve the equation by completing the square.

133) \(x^2 + 4x - 21 = 0\)
   A) 3, -7  B) -3, 7  C) \(\sqrt{5}, -1\)  D) -14, -7

Objective: (18.1) Solve quadratic equations by completing the square.

Use the quadratic formula to solve the equation.

134) \(x^2 - 2x - 48 = 0\)
   A) -6, 8  B) 6, -8  C) 6, 8  D) -48, 0

Objective: (18.2) Solve quadratic equations by using the quadratic formula.

135) \(x^2 + 24x + 144 = 0\)
   A) -12, 12  B) -12  C) 12 - i, 12 + i  D) 12

Objective: (18.2) Solve quadratic equations by using the quadratic formula.

136) \(x^2 + 18x + 70 = 0\)
   A) \(-9 - \sqrt{11}, -9 + \sqrt{11}\)  B) \(9 + \sqrt{11}\)
   C) \(9 - \sqrt{70}, 9 + \sqrt{70}\)  D) \(-18 + \sqrt{70}\)

Objective: (18.2) Solve quadratic equations by using the quadratic formula.

137) \(x^2 - 8x + 20 = 0\)
   A) 4 - 2i, 4 + 2i  B) 4 - 4i, 4 + 4i  C) 4 + 2i  D) 6, 2

Objective: (18.2) Solve quadratic equations by using the quadratic formula.

138) \(2x^2 - 7x - 9 = 0\)
   A) \(\frac{2}{9}, 1\)  B) \(\frac{9}{2}, -1\)  C) \(\frac{2}{9}, 0\)  D) \(\frac{2}{9}, -1\)

Objective: (18.2) Solve quadratic equations by using the quadratic formula.

139) \(5x^2 + 12x = -6\)
   A) \(-\frac{6 - \sqrt{6}}{5}, \frac{-6 + \sqrt{6}}{5}\)  B) \(-\frac{6 - \sqrt{6}}{10}, \frac{-6 + \sqrt{6}}{10}\)
   C) \(-\frac{12 - \sqrt{6}}{5}, \frac{-12 + \sqrt{6}}{5}\)  D) \(-\frac{6 - \sqrt{66}}{5}, \frac{-6 + \sqrt{66}}{5}\)

Objective: (18.2) Solve quadratic equations by using the quadratic formula.

Sketch the graph of the quadratic function. Give the vertex and axis of symmetry.
140) $f(x) = x^2 - 4$

A) vertex $(0, -4)$; axis $x = 0$

B) vertex $(4, 0)$; axis $x = 4$

C) vertex $(-4, 0)$; axis $x = -4$

D) vertex $(0, 4)$; axis $x = 0$

Objective: (18.5) Graph quadratic functions of the form $f(x) = x^2 + k$. 

m50-44
141) \( f(x) = (x + 5)^2 \)

A) vertex \((-5, 0); \) axis \(x = -5\)

B) vertex \((5, 0); \) axis \(x = 5\)

C) vertex \((0, 5); \) axis \(x = 0\)

D) vertex \((0, -5); \) axis \(x = 0\)

Objective: (18.5) Graph quadratic functions of the form \( f(x) = (x - h)^2. \)
142) \( f(x) = (x + 6)^2 + 4 \)

**A)** vertex \((-6, 4)\); axis \(x = -6\)

**B)** vertex \((6, 4)\); axis \(x = 6\)

**C)** vertex \((-4, 6)\); axis \(x = -4\)

**D)** vertex \((4, -6)\); axis \(x = 4\)

**Objective:** 18.5 Graph quadratic functions of the form \( f(x) = (x - h)^2 + k \).
143) \( f(x) = -3x^2 \)

A) vertex \((0, 0)\); axis \(x = 0\)

B) vertex \((0, 0)\); axis \(x = 0\)

C) vertex \((0, 0)\); axis \(x = 0\)

D) vertex \((0, -3)\); axis \(x = 0\)

Objective: (18.5) Graph quadratic functions of the form \( f(x) = ax^2 \).

Find the vertex of the graph of the quadratic function.

144) \( f(x) = x^2 + 6x - 4 \)
   A) \((-3, -13)\)  
   B) \((3, 23)\)  
   C) \((6, 68)\)  
   D) \((-3, -31)\)

   Objective: (18.6) Find the vertex of the graph of a quadratic function.

145) \( f(x) = -x^2 - 10x + 9 \)
   A) \((-5, 34)\)  
   B) \((5, -66)\)  
   C) \((-10, 9)\)  
   D) \((5, -16)\)

   Objective: (18.6) Find the vertex of the graph of a quadratic function.
146) \( f(x) = 7x^2 + 14x - 9 \)

A) \((-1, -16)\)  
B) \((1, 12)\)  
C) \((-2, 5)\)  
D) \((2, 47)\)

Objective: (18.6) Find the vertex of the graph of a quadratic function.

Match the function with its graph.

147) \( f(x) = x^2 + 4x - 5 \)

A)

B)

C)

D)

Objective: (18.6) Graph a quadratic function and find the vertex, intercepts, and direction of opening.
148) \( f(x) = x^2 + 6x + 5 \)

A) \((-3, -4)\)

B) \((3, -4)\)

C) \((3, 4)\)

D) \((-3, 4)\)

Objective: (18.6) Graph a quadratic function and find the vertex, intercepts, and direction of opening.
149) \( f(x) = -x^2 - 6x - 5 \)

A)

B)

C)

D)

Objective: (18.6) Graph a quadratic function and find the vertex, intercepts, and direction of opening.
150) \( f(x) = x^2 + 6x \)

A)

\[
\begin{array}{c}
\text{Graph}
\\
\text{(-3, -9)}
\\
\end{array}
\]

B)

\[
\begin{array}{c}
\text{Graph}
\\
\text{(-3, 9)}
\\
\end{array}
\]

C)

\[
\begin{array}{c}
\text{Graph}
\\
\text{(3, -9)}
\\
\end{array}
\]

D)

\[
\begin{array}{c}
\text{Graph}
\\
\text{(3, 9)}
\\
\end{array}
\]

Objective: (18.6) Graph a quadratic function and find the vertex, intercepts, and direction of opening.
151) \( f(x) = -x^2 - 6x \)

A)

B)

C)

D)

Objective: (18.6) Graph a quadratic function and find the vertex, intercepts, and direction of opening.
152) \( f(x) = x^2 - 4 \)

A) 

B) 

C) 

D) 

Objective: (18.6) Graph a quadratic function and find the vertex, intercepts, and direction of opening.
153) \( f(x) = x^2 - 8x + 7 \)

A)

B)

C)

D)

Objective: (18.6) Graph a quadratic function and find the vertex, intercepts, and direction of opening.

Graph the exponential function.

154) \( f(x) = 4^x \)
Objective: (19.3) Graph exponential functions.

155) \( f(x) = \left( \frac{1}{2} \right)^x \)
Objective: (19.3) Graph exponential functions.

The graph of an exponential function is given. Match the graph to one of the following functions.

A) $f(x) = 4^x$  B) $f(x) = 4^x + 2$  C) $f(x) = 4^x + 2$  D) $f(x) = 4^x - 2$

Objective: (19.3) Graph exponential functions.
A) \( f(x) = \left(\frac{1}{5}\right)^x \)
B) \( f(x) = 5^x \)
C) \( f(x) = -5x \)
D) \( f(x) = -\frac{1}{5}x \)

Objective: (19.3) Graph exponential functions.

Solve.

158) Four bacteria are placed in a petri dish. The population will triple every day. The formula for the number of bacteria in the dish on day \( t \) is \( N(t) = 4(3)^t \), where \( t \) is the number of days after the four bacteria are placed in the dish. How many bacteria are in the dish five days after the four bacteria are placed in the dish?
A) 972 bacteria  
B) 60 bacteria  
C) 500 bacteria  
D) 12 bacteria

Objective: (19.3) Solve problems modeled by exponential equations.

Write the first five terms of the sequence whose general term is given.

159) \( a_n = n - 4 \)
A) -3, -2, -1, 0, 1  
B) -4, -3, -2, -1, 0  
C) -1, 0, 1, 2, 3  
D) -16, -12, -8, -4, 0

Objective: (21.1) Write the terms of a sequence given its general term.

160) \( a_n = n^2 - n \)
A) 0, 2, 6, 12, 20  
B) 2, 6, 12, 20, 30  
C) 1, 4, 9, 16, 25  
D) 0, 3, 8, 15, 24

Objective: (21.1) Write the terms of a sequence given its general term.

161) \( a_n = 2n - 2 \)
A) 0, 2, 4, 6, 8  
B) 0, 1, 2, 3, 4  
C) 4, 6, 8, 10, 12  
D) 0, -2, -4, -6, -8

Objective: (21.1) Write the terms of a sequence given its general term.
1) A  
2) A  
3) A  
4) A  
5) A  
6) A  
7) A  
8) A  
9) D  
10) C  
11) A  
12) A  
13) A  
14) A  
15) A  
16) A  
17) A  
18) A  
19) A  
20) A  
21) A  
22) A  
23) A  
24) A  
25) A  
26) A  
27) A  
28) A  
29) A  
30) A  
31) C  
32) B  
33) C  
34) A  
35) A  
36) A  
37) A  
38) A  
39) A  
40) A  
41) A  
42) A  
43) A  
44) A  
45) A  
46) A  
47) A  
48) B  
49) A  
50) A
51) A
52) A
53) A
54) A
55) A
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59) A
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72) A
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75) A
76) A
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78) A
79) A
80) A
81) A
82) A
83) A
84) A
85) A
86) A
87) A
88) A
89) A
90) A
91) A
92) A
93) A
94) A
95) A
96) A
97) A
98) A
99) A
100) A
Answer Key

Testname: AAM0320201851T4HIGHSCHOOL161

101) A
102) A
103) A
104) A
105) A
106) A
107) A
108) A
109) A
110) A
111) A
112) A
113) A
114) A
115) A
116) A
117) B
118) A
119) A
120) A
121) A
122) A
123) A
124) A
125) A
126) A
127) A
128) A
129) A
130) A
131) A
132) A
133) A
134) A
135) B
136) A
137) A
138) B
139) A
140) A
141) A
142) A
143) A
144) A
145) A
146) A
147) A
148) A
149) A
150) A
Answer Key
Testname: AAM0320201851T4HIGHSCHOOL161

151) A
152) A
153) A
154) A
155) A
156) A
157) A
158) A
159) A
160) A
161) A