Name________________________________________________________
BE SURE TO BUBBLE IN SCHOOL ID NUMBER

Student ID: ABCDE

ALGEBRA 2 WINTER BREAK
Identify a pattern and find the next number in the pattern.

1. –96, –48, –24, –12
   a. –6   b. 0   c. 2   d. 6

Use a pattern to answer each question.

2. Every day you collect 3 pennies and keep them in a jar. So the first day you have 3, the second day you have 6, the third day you have 9, etc. How many do you have on the 13th day?
   a. 16   b. 13   c. 39   d. 52

3. Yesterday you borrowed $40 from your brother. Every day that you don’t pay it back, you owe $0.50 more. So today, day one, you owe him $40.50, on day two you will owe him $41.00, on day three you will owe him $41.50, etc. If you still haven’t paid him back, how much will you owe him on day 17?
   a. $8.50   b. $680.50   c. $680.00   d. $48.50

To which set of numbers does the number belong?

4. –40
   a. irrational numbers   b. integers   c. whole numbers   d. natural numbers

Insert <, >, or = to make the sentence true.

5. \(\frac{1}{2} \quad \square \quad \frac{2}{5}\)
   a. >   b. <   c. =

6. \(\sqrt{3} \quad \square \quad \sqrt{7}\)
   a. >   b. <   c. =

Name the property of real numbers illustrated by the equation.

7. \(-4(x + 3) = -4x - 12\)

8. \(\pi + 10 = 10 + \pi\)
Use a graph to find the solution.

9. You want to set up an aquarium and need to determine what size tank to buy. The graph shows tank sizes using a rule that relates the capacity of the tank to the combined lengths of the fish it can hold.

If you want three 2-in. goldfish, five 1-in. guppies, and a 3-in. loach, what is the smallest capacity tank you can buy?

![Graph showing tank sizes vs. fish lengths]

- a. 14-gallon
- b. 17-gallon
- c. 18-gallon
- d. 19-gallon

Which algebraic expression models the given word phrase?

10. 40 fewer than a number $t$

- a. $-40t$
- b. $t + 40$
- c. $40 - t$
- d. $t - 40$

11. You start with $15 and save $8 each week. What algebraic expression models the total amount you save?

- a. $8 + 15w$
- b. $15 - 8w$
- c. $15 + 8w$
- d. $23w$

Evaluate the expression for the given value of the variable(s).

12. \[
\frac{4(3h - 6)}{1 + h}; \quad h = -2
\]

- a. 32
- b. 48
- c. -48
- d. 30

Combine like terms. What is a simpler form of each expression?

13. $-3(-4y + 3) + 7y$

- a. $19y - 9$
- b. $10y$
- c. $-19y + 3$
- d. $-19y - 9$
Solve the equation.

14. \(-2y - 4 = 8 - y\)
   a. \(y = -12\)  b. \(y = -2\)  c. \(y = -4\)  d. \(y = -\frac{1}{12}\)

15. \(-5y - 9 = -(y - 1)\)
   a. \(y = -\frac{1}{2}\)  b. \(y = -2\frac{1}{2}\)  c. \(y = -2\)  d. \(y = -\frac{2}{5}\)

Use an algebraic equation to solve the problem.

16. A rectangle is 3 times as long as it is wide. The perimeter is 60 cm. Find the dimensions of the rectangle. Round to the nearest tenth if necessary.
   a. 7.5 cm by 22.5 cm  b. 7.5 cm by 52.5 cm  c. 20 cm by 60 cm  d. 15 cm by 22.5 cm

Is the following always, sometimes, or never true?

17. \(8 + 6x - 10 = 10x + 11 - 4x\)
   a. always  b. sometimes  c. never

Solve the equation or formula for the indicated variable.

18. \(S = 5r^2t\), for \(t\)
   a. \(t = \frac{S}{5} - r\)  b. \(t = \frac{25r}{S}\)  c. \(t = r^2 - 5S\)  d. \(t = \frac{S}{5r^2}\)

What inequality represents the sentence?

19. 14 fewer than a number is at least \(-8\)
   a. \(x + 14 \leq -8\)  b. \(x - 14 \geq -8\)  c. \(14 - x \geq -8\)  d. \(x - 14 < -8\)

Solve the inequality. Graph the solution set.

20. \(26 + 6b \geq 2(3b + 4)\)
   a. all real numbers  b. \(b \leq \frac{1}{2}\)  c. \(b \geq \frac{1}{2}\)  d. no solutions
Solve the compound inequality. Graph the solution.

21. \(4x + 3 \geq -17\) and \(7x - 4 \leq 10\)
   a. \(x \geq -3 \frac{1}{2}\) or \(x \leq 2\)
   b. \(x \geq -3 \frac{1}{2}\) or \(x \leq 6\)
   c. \(x \geq -5\) and \(x \leq \frac{6}{7}\)
   d. \(x \geq -5\) and \(x \leq 2\)

22. \(9x - 5 < -41\) or \(3x + 13 > 7\)
   a. \(x < -5 \frac{1}{9}\) or \(x > -2\)
   b. \(x < -5 \frac{1}{9}\) or \(x > \frac{2}{3}\)
   c. \(x < -4\) or \(x > \frac{2}{3}\)
   d. \(x < -4\) or \(x > -2\)

Solve the absolute value equation. Graph the solution.

23. \(4|4x - 3| - 8 = -4\)
   a. \(x = \frac{7}{16}\) or \(x = 1\)
   b. \(x = 1\) or \(x = \frac{1}{2}\)
   c. \(x = \frac{7}{16}\) or \(x = \frac{15}{16}\)
   d. \(x = \frac{7}{16}\) or \(x = \frac{1}{2}\)

Solve the equation. Check for extraneous solutions.

24. \(2|7 - 7x| = 2x + 4\)
   a. \(x = \frac{3}{2}\) or \(x = \frac{5}{6}\)
   b. \(x = \frac{3}{2}\) or \(x = \frac{5}{8}\)
   c. \(x = \frac{5}{8}\)
   d. \(x = \frac{3}{2}\)
Solve the inequality. Graph the solution.

25. \( |2x + 4| \geq 22 \)

a. \( x \geq -13 \) or \( x \leq 9 \)

b. \( x \leq -9 \) or \( x \geq 9 \)

c. \( x \leq -13 \) or \( x \geq 9 \)

d. \( x \leq -26 \) or \( x \geq 18 \)

26. \( |2x + 5| \leq 15 \)

a. \( x \leq -5 \) or \( x \geq 5 \)

b. \(-20 \leq x \leq 10 \)

c. \(-10 \geq x \geq 5 \)

d. \(-10 \leq x \leq 5 \)

27. Graph the relation. Find the domain and range.

\[ \left\{ \left( -1, \frac{1}{2} \right), \left( -\frac{1}{2}, -1 \right), \left( \frac{3}{2}, 0 \right), \left( 2, \frac{3}{2} \right) \right\} \]

a. domain: \( \left\{ -1, -\frac{1}{2}, \frac{3}{2}, 2 \right\} \)

range: \( \left\{ -1, 0, \frac{1}{2}, \frac{3}{2} \right\} \)

c. domain: \( \left\{ -1, -\frac{1}{2}, 2, \frac{3}{2} \right\} \)

range: \( \left\{ -1, 0, \frac{1}{2}, \frac{3}{2} \right\} \)
Is the relation a function?

28. \{(14, 9), (15, 8), (8, 7), (1, 9), (15, 2)\}

a. yes   b. no
29. Use the vertical-line test to determine which graph represents a function.

a. 

b. 

c. 

d. 

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

30. For \( f(x) = -3x + 6 \), find \( f(2) \).

a. 0  b. -12  c. 9  d. 12

31. Tickets to a concert are available online for $20 each, plus a one-time handling fee of $1.75. The total cost is a function of the number of tickets bought. What function rule models the cost of the concert tickets \( (t) \)? Evaluate the function for 3 tickets.

a. \( 20t + 1.75; \ $25.25 \)

b. \( 1.75t + 20; \ $25.25 \)

c. \( 20t + 1.75; \ $61.75 \)

d. \( 1.75t + 20; \ $61.75 \)

Determine whether \( y \) varies directly with \( x \). If so, find the constant of variation \( k \).

32. \( y + 2x = -19 \)

a. yes; 2  b. yes; -2  c. yes; 1  d. no
Find the value of \( y \) for a given value of \( x \), if \( y \) varies directly with \( x \).

___ 33. If \( y = 44 \) when \( x = -264 \), what is \( y \) when \( x = -486 \)?
   a. \(-2916\)  
   b. \(-81\)  
   c. 2916  
   d. 81

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

___ 34. (6, 2) and (7, 4)
   a. \(-2\)  
   b. \(-\frac{1}{2}\)  
   c. \(\frac{1}{2}\)  
   d. 2

What is an equation of the line in slope intercept form?

___ 35. \( m = \frac{1}{2} \) and the \( y \)-intercept is \((0, -5)\)
   a. \(y = \frac{1}{2}x - 5\)  
   b. \(y = -5x + \frac{1}{2}\)  
   c. \(y = \frac{1}{2}x + 5\)  
   d. \(y = 5x - \frac{1}{2}\)

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

___ 36. \(-11x + 9y = -12\)
   a. \(y = -\frac{11}{9}x + \frac{4}{3}\); slope: \(\frac{11}{9}\); \( y \)-intercept: \(\frac{4}{3}\)
   b. \(y = -\frac{11}{9}x + \frac{4}{3}\); slope: \(\frac{11}{9}\); \( y \)-intercept: \(\frac{4}{3}\)
   c. \(y = \frac{11}{9}x - \frac{4}{3}\); slope: \(\frac{11}{9}\); \( y \)-intercept: \(\frac{4}{3}\)
   d. \(y = \frac{11}{9}x + \frac{4}{3}\); slope: \(\frac{4}{3}\); \( y \)-intercept: \(\frac{11}{9}\)
What is the graph of the equation?

37. \(-5x + y = -4\)
   a. 
   b. 
   c. 
   d. 

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

38. points: \((-2,10), (10,-14)\)
   a. \(y - 2 = \frac{1}{2}(x + 10)\)  
   b. \(y - 10 = -\frac{1}{2}(x + 2)\)  
   c. \(y - 10 = -2(x + 2)\)  
   d. \(y - 2 = -2(x - 10)\)
What is the equation of the given line in standard form? Use integer coefficients.

39. \[ y = \frac{5}{7}x - 12 \]

a. \(-5x + 7y = -12\)  
b. \(-5x - 7y = -84\)  
c. \(-5x + 7y = -84\)  
d. \(5x + 7y = -84\)

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

40. \(-2x + 3y = -8\)

\begin{align*}
\text{a. } x\text{-intercept: } & (-4, 0) \\
\text{y-intercept: } & (0, 4) \\
\text{b. } x\text{-intercept: } & (-4, 0) \\
\text{y-intercept: } & (0, 4) \\
\text{c. } x\text{-intercept: } & (4, 0) \\
\text{y-intercept: } & (0, -4) \\
\text{d. } x\text{-intercept: } & (4, 0) \\
\text{y-intercept: } & (0, -4)
\end{align*}
41. The office manager of a small office ordered 180 packs of printer paper. Based on average daily use, she knows that the paper will last about 40 days. What graph represents this situation? How many packs of printer paper should the manager expect to have after 35 days?

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

What is the equation of the line in slope-intercept form?

42. the line parallel to \( y = 8x - 8 \) through (5, 2)
   a. \( y = 8x - 38 \)    b. \( y = 8x - 42 \)    c. \( y = -\frac{1}{8}x - 38 \)    d. \( y = -8x - 38 \)

43. the line perpendicular to \( y = \frac{1}{3}x + 5 \) through (2, 1)
   a. \( y = \frac{1}{3}x + 7 \)    b. \( y = -3x + 7 \)    c. \( y = 3x + 7 \)    d. \( y = -\frac{1}{3}x + 7 \)
44. The table shows the median home prices in Florida. What is the equation of a trend line that models a relationship between time and home prices? Use the equation to predict the median home price in 2020.

<table>
<thead>
<tr>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Median Price($)</td>
<td>$20,200</td>
<td>$39,900</td>
<td>$50,400</td>
<td>$62,800</td>
<td>$89,100</td>
<td>$98,700</td>
<td>$119,000</td>
</tr>
</tbody>
</table>

a. $y = 1646.67x + 20,200; \quad \$151,900$  
   b. $y = 49.4x + 20,200; \quad \$119,000$  
   c. $y = 49.4x + 20,200; \quad \$151,900$  
   d. $y = 1646.67x + 20,200; \quad \$119,000$

45. A 3-mi cab ride costs $7.90. A 9-mi cab ride costs $18.70. Find a linear equation that models a relationship between cost $c$ and distance $d$.

a. $c = 1.80d + 2.50$  
   b. $c = 2.08d + 2.50$  
   c. $c = 2.63d + 10.80$  
   d. $d = 1.80c + 10.80$

Find the function rule for $g(x)$.

46. The function $f(x) = -6x$. The graph of $g(x)$ is $f(x)$ vertically stretched by a factor of 7 and reflected in the $x$-axis. What is the function rule for $g(x)$?

a. $g(x) = -\frac{6}{7}x$  
   b. $g(x) = 42x$  
   c. $g(x) = \frac{6}{7}x$  
   d. $g(x) = -42x$

What transformations change the graph of $f(x)$ to the graph of $g(x)$?

47. $f(x) = 3x^2 \quad g(x) = 9x^2 - 4$

a. The graph of $g(x)$ is the graph of $f(x)$ stretched vertically by a factor of 3 and translated up 4 units.
   b. The graph of $g(x)$ is the graph of $f(x)$ stretched vertically by a factor of $\frac{1}{3}$ and translated up 4 units.
   c. The graph of $g(x)$ is the graph of $f(x)$ stretched vertically by a factor of 3 and translated down 4 units.
   d. The graph of $g(x)$ is the graph of $f(x)$ stretched vertically by a factor of $\frac{1}{3}$ and translated down 4 units.

48. $f(x) = x^2 \quad g(x) = (x + 5)^2 - 9$

a. The graph of $g(x)$ is the graph of $f(x)$ translated to the left 5 units and down 9 units. 
   b. The graph of $g(x)$ is the graph of $f(x)$ translated to the up 5 units and right 9 units. 
   c. The graph of $g(x)$ is the graph of $f(x)$ translated to the down 5 units and left 9 units. 
   d. The graph of $g(x)$ is the graph of $f(x)$ translated to the right 5 units and up 9 units.
Graph the set of data. Decide whether a linear model is reasonable. If so, draw a trend line and write its equation.

49. \{(1, 7), (-2, 1), (3, 13), (-4, -3), (0, 5)\}

a. yes; \(y = 0.9x + 8.6\)

b. yes; \(y = \frac{7}{2}x - 2\)

c. yes; \(y = \frac{5}{2}x + 5\)

d. yes; \(y = 5\)
What is the graph of the absolute value equation?

50. \( y = |x + 5| + 2 \)
   a. 
   
   b. 
   
   c. 
   
   d. 

51. Which of the following describes the translation of \( y = |x| \) to \( y = |x + 7| - 2 \)?
   a. \( y = |x| \) translated 2 units to the left and 7 units down
   b. \( y = |x| \) translated 2 units to the right and 7 units up
   c. \( y = |x| \) translated 7 units to the right and 7 units down
   d. \( y = |x| \) translated 7 units to the left and 2 units down
What is the graph of the absolute value function?

52. \( y = 2|x| \)

a. 

b. 

c. 

d. 
What is the equation of the absolute value function?

53. 

\[ y = \frac{1}{4} |x| - 3 \]
What is the graph of each inequality?

54. $4x + 2y \leq 6$

a. 

b. 

c. 

d.
55. An electronics store makes a profit of $33 for every portable DVD player sold and $88 for every DVD recorder sold. The manager’s target is to make at least $264 a day on sales of the portable DVD players and DVD recorders. Write and graph an inequality that represents the number of both kinds of DVD players that can be sold to reach or beat the sales target. Let \( p \) represent the number of portable DVD players and \( r \) represent the number of DVD recorders.

a. \( 33p + 88r \geq 264 \)

b. \( 33p + 88r \geq 264 \)

c. \( 88p + 33r \geq 264 \)

d. \( 88p + 33r \geq 264 \)
What is the graph of each absolute value inequality?

56. \( y > |x - 1| + 3 \)

a. 

b. 

c. 

d. 
Solve the system by graphing.

57. \[
\begin{align*}
-3x - 2y &= -7 \\
3x - y &= 10
\end{align*}
\]

a. \((3, -1)\)  

b. \((1, 3)\)

c. \((0, 4)\)

d. \((3, 1)\)

58. A rental car agency charges a flat fee of $138.00 plus $27.00 per day to rent a certain car. Another agency charges a fee of $47.00 plus $40.00 per day to rent the same car.

Using a graphing calculator, find the number of days for which the costs are the same. Round your answer to the nearest whole number of days.

a. 11  
b. 10  
c. 7  
d. 3

Without graphing, is each system independent, dependent, or inconsistent?

59. \[
\begin{align*}
-x - 5y &= 7 \\
4x - y &= -7
\end{align*}
\]

a. inconsistent  
b. independent  
c. dependent
60. \[
\begin{align*}
y &= 4x + 6 \\
-8x + 2y &= 12
\end{align*}
\]
a. independent  b. inconsistent  c. dependent

Solve the system by substitution.

61. \[
\begin{align*}
-2.5x + y &= 13.5 \\
2.25x - y &= -12.25
\end{align*}
\]
a. \((-5, 1)\)  b. \((-1, 5)\)  c. \((1, -5)\)  d. \((5, -1)\)

Solve the system using elimination.

62. \[
\begin{align*}
-4x + 4y &= -8 \\
x - 4y &= -7
\end{align*}
\]
a. \((3, 5)\)  b. \((5, 3)\)  c. \((-3, -5)\)  d. \((-5, -3)\)

What are the solutions of the following systems?

63. \[
\begin{align*}
-x + 2y &= 10 \\
-3x + 6y &= 11
\end{align*}
\]
a. infinitely many solutions  b. \((-5, 2)\)  c. \((5, -2)\)  d. no solutions

64. \[
\begin{align*}
x - 3y &= 9 \\
-x + 3y &= -9
\end{align*}
\]
a. \((5, -6)\)  b. no solutions  c. \((-5, 6)\)  d. infinitely many solutions
Solve the system of inequalities by graphing.

65. \[
\begin{align*}
  y &\leq -3x - 1 \\
  y &> 3x - 2
\end{align*}
\]

a. 

b. 

c. 

d. 
Solve the system of inequalities by graphing.

66. \[ \begin{cases} y \geq 4 \\ y > |x - 1| \end{cases} \]

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

Graph the system of constraints and find the value of \( x \) and \( y \) that maximize the objective function.

67. Constraints

\[ \begin{cases} x \geq 0 \\ y \geq 0 \\ y \leq \frac{1}{3} x + 2 \\ 4 \geq y + x \end{cases} \]

Objective function: \( C = 7x - 3y \)

- a. (1.5, 2.5)  
- b. (0, 2)  
- c. (4, 0)  
- d. (0, 0)
68. Find the values of $x$ and $y$ that maximize the objective function $P = 3x + 2y$ for the graph. What is the maximum value?

- a. maximum value at $(5, 4); 32$
- b. maximum value at $(0, 8); 16$
- c. maximum value at $(9, 0); 27$
- d. maximum value at $(0, 0); 0$

69. Your computer supply store sells two types of inkjet printers. The first, type A, costs $267 and you make a $24 profit on each one. The second, type B, costs $127 and you make a $20 profit on each one. You can order no more than 170 printers this month, and you need to make at least $3760 profit on them. If you must order at least one of each type of printer, how many of each type of printer should you order if you want to minimize your cost?

- a. 80 of type A, 90 of type B
- b. 102 of type A, 68 of type B
- c. 68 of type A, 102 of type B
- d. 90 of type A, 80 of type B
What is the graph of the function?

70. \( f(x) = 2x^2 \)

a. [Graph A]

b. [Graph B]

c. [Graph C]

d. [Graph D]
Graph each function. How is each graph a translation of \( f(x) = x^2 \)?

71. \( y = (x - 2)^2 \)
   
   a. translated down 2 unit(s)
   
   b. translated to the right 2 unit(s)
   
   c. translated to the left 2 unit(s)
   
   d. translated up 2 unit(s)
72. \( y = (x + 3)^2 + 4 \)
   a. translated down 4 unit(s) and translated to the left 3 unit(s)
   b. translated up 4 unit(s) and translated to the left 3 unit(s).
   c. translated down 4 unit(s) and translated to the right 3 unit(s)
   d. translated up 4 unit(s) and translated to the right 3 unit(s)

73. Identify the vertex and the axis of symmetry of the graph of the function \( y = 2(x + 2)^2 - 4 \).
   a. vertex: \((-2, 4)\);
      axis of symmetry: \( x = -2 \)
   b. vertex: \((2, -4)\);
      axis of symmetry: \( x = 2 \)
   c. vertex: \((-2, -4)\);
      axis of symmetry: \( x = -2 \)
   d. vertex: \((2, 4)\);
      axis of symmetry: \( x = 2 \)
74. Identify the maximum or minimum value and the domain and range of the graph of the function $y = 2(x + 2)^2 - 3$.

a. Minimum value: 3  
   Domain: all real numbers  
   Range: all real numbers

b. Maximum value: -3  
   Domain: all real numbers  
   Range: all real numbers

c. Maximum value: 3  
   Domain: all real numbers  
   Range: all real numbers

d. Minimum value: -3  
   Domain: all real numbers  
   Range: all real numbers

75. Suppose a parabola has vertex (-8, -7) and also passes through the point (-7, -4). Write the equation of the parabola in vertex form.

a. $y = (x + 8)^2 - 7$  
   b. $y = 3(x - 8)^2 - 7$  
   c. $y = 3(x + 8)^2 - 7$  
   d. $y = 3(x + 8)^2 + 7$

What are the vertex and the axis of symmetry of the equation?

76. $y = 2x^2 + 24x - 16$

a. Vertex: (-6, -88)  
   Axis of symmetry: $x = -6$  
   b. Vertex: (-6, 88)  
   Axis of symmetry: $y = -6$

   c. Vertex: (6, -88)  
   Axis of symmetry: $x = -88$  
   d. Vertex: (-6, -88)  
   Axis of symmetry: $x = -88$
What is the graph of the equation?

77. \( y = x^2 - 4x + 5 \)

a. 

b. 

c. 

d.

What is the vertex form of the equation?

78. \( y = -x^2 + 2x - 8 \)

a. \( y = (x - 1)^2 + 7 \)  
b. \( y = -(x - 1)^2 - 7 \)  
c. \( y = -(x + 1)^2 + 7 \)  
d. \( y = (x + 1)^2 - 7 \)
79. Sketch a parabola with an axis of symmetry $x = -1$, $y$-intercept 1, and point $(1, -5)$.

What is the expression in factored form?

80. $x^2 + 14x + 48$
   a. $(x + 6)(x - 8)$  b. $(x + 8)(x - 6)$  c. $(x - 8)(x - 6)$  d. $(x + 6)(x + 8)$

What is the expression in factored form?

81. $16x^2 + 8x$
   a. $-4x(4x + 2)$  b. $4x(4x - 2)$  c. $4x(4x + 2)$  d. $4(4x + 2)$

82. $-4x^2 + 8x + 32$
   a. $-4(x - 4)(x + 2)$  b. $-4(x - 4)(x - 2)$  c. $-4(x + 4)(x + 2)$  d. $-4(x + 4)(x - 2)$

83. $3x^2 + 26x + 35$
   a. $(x + 5)(3x + 7)$  b. $(3x + 7)(x - 5)$  c. $(3x + 5)(x - 7)$  d. $(3x + 5)(x + 7)$
84. \( x^2 - 64 \)
   a. \((-x + 8)(x - 8)\)  b. \((x + 8)(-x - 8)\)  c. \((x + 8)(x - 8)\)  d. \((x - 8)^2\)

85. The function \( y = -16t^2 + 486 \) models the height \( y \) in feet of a stone \( t \) seconds after it is dropped from the edge of a vertical cliff. How long will it take the stone to hit the ground? Round to the nearest hundredth of a second.
   a. 7.79 seconds   b. 11.02 seconds   c. 0.25 seconds   d. 5.51 seconds

What value completes the square for the expression?

86. \( x^2 - 18x \)
   a. 9   b. -9   c. 81   d. -81

Solve the quadratic equation by completing the square.

87. \( x^2 + 10x + 14 = 0 \)
   a. \(-10 \pm 6\)   b. \(100 \pm \sqrt{11}\)   c. \(5 \pm 6\)   d. \(-5 \pm \sqrt{11}\)

Rewrite the equation in vertex form. Name the vertex and \( y \)-intercept.

88. \( y = x^2 - 12x + 34 \)
   a. \( y = (x - 6)^2 - 2 \)  
      vertex: \((6, -2)\)  
      \( y \)-intercept: \((0, 34)\)  
   b. \( y = (x - 12)^2 - 2 \)  
      vertex: \((-12, -2)\)  
      \( y \)-intercept: \((0, -2)\)  
   c. \( y = (x - 12)^2 + 40 \)  
      vertex: \((-12, -2)\)  
      \( y \)-intercept: \((0, 34)\)  
   d. \( y = (x - 6)^2 + 70 \)  
      vertex: \((6, -2)\)  
      \( y \)-intercept: \((0, -2)\)

Use the Quadratic Formula to solve the equation.

89. \(-2x^2 - 5x + 5 = 0\)
   a. \(-\frac{5}{2} \pm \frac{\sqrt{65}}{2}\)  
   b. \(-\frac{5}{4} \pm \frac{\sqrt{32}}{2}\)  
   c. \(-\frac{4}{5} \pm \frac{\sqrt{130}}{4}\)  
   d. \(-\frac{5}{4} \pm \frac{\sqrt{65}}{4}\)

What is the number of real solutions?

90. \(8x^2 - 11x = -3\)
   a. one real solution   b. two real solutions   c. no real solutions   d. cannot be determined
Simplify the number using the imaginary unit $i$.  

91. $\sqrt{-144}$
   a. 12  
   b. $-12$  
   c. 12i  
   d. 144i

92. Identify the graph of $-1 + 2i$.
   a. 
   b. 
   c. 
   d. 

What is the absolute value of each number?

93. $-1 + 3i$.
   a. 2  
   b. $-8$  
   c. $\sqrt{10}$  
   d. $\sqrt{-3}$

Simplify the expression.

94. $(1 - 2i) + (-2 - i)$
   a. $1 + 3i$  
   b. $-4i$  
   c. $-1 - 3i$  
   d. $-1 - 3i$

95. $(i)(-7i)$
   a. $7i$  
   b. $-7$  
   c. 7  
   d. $-7i$
96. \((4 - i)(2 + 5i)\)
   a. \(2(4 + 9i)\) b. \((13 + 18i)\) c. \(3 + 18i\) d. \((8 + 18i)\)

97. \(-\frac{2 - 3i}{6i}\)
   a. \(\frac{1}{2} - \frac{1}{3}i\) b. \(\frac{1}{2} + \frac{1}{3}i\) c. \(-\frac{1}{2} + \frac{1}{3}i\) d. \(-\frac{1}{2} + \frac{1}{3}i\)

**What pair of factors should be used to find the complex solutions for** \(x^2\)?

98. \(16x^2 + 4 = 0\)
   a. \((4x + 2i)(4x + 2i)\) b. \((2x + 4)(2x + 4)\) c. \((4x + 2i)(4x - 2i)\) d. \((2x - 4i)(2x + 4i)\)

99. Find the solutions of the equation.
\(\frac{1}{2}x^2 - x + 5 = 0\)
   a. \(1 \pm \sqrt{9}i\) b. \(-1 \pm \sqrt{9}i\) c. \(1 \pm \sqrt{11}i\) d. \(-1 \pm \sqrt{11}i\)

**What is the solution of the linear-quadratic system of equations**?

100. \[
\begin{align*}
y &= x^2 + 7x + 13 \\
y &= x + 5
\end{align*}
\]
   a. \((-4, 1)\) b. \((1, -4)\) c. \((-4, 1)\) d. \((1, -4)\)