MID-TERM - STUDY - GUIDE:

Algebra 2 CH 1 Review

1. Copy and complete: In a power, the __?__ represents the number of times the __?__ is used as a factor.
2. Copy and complete: If substituting a number for a variable in an equation results in a true statement, then the number is a(n) __?__ of the equation.
3. Copy and complete: A(n) __?__ is an apparent solution that must be rejected because it does not satisfy the original equation.
4. Identify the like terms in the expression $40 + 3x^3 + 3x^2 - 7 - x^2$.
5. Give an example of two equivalent algebraic expressions.
6. **WRITING** *Compare* the procedures for solving a linear equation and a linear inequality. How are they similar? How are they different?

Identify the property that the statement illustrates.

7. $17 \cdot \frac{1}{17} = 1$
8. $60 + 0 = 60$
9. $3a + 7a = (3 + 7)a$

Simplify the expression.

10. $25x + 14 - 17 - 6x$
11. $6y + 12x - 12y - 9x$
12. $6(n - 2) - 8n + 40$
13. $5(2b + 3) + 8(b - 6)$
14. $3g + 9g^2 - 12g^2 + g$
15. $7t^4 + 7t^2 - 2t^2 - 9t^4$
16. **TAXI RATES** A New York City taxi charges \$2.50, plus \$.40 for each fifth of a mile if it is not delayed by traffic. Write an expression for the cost of the ride if you travel x miles in the taxi with no traffic delays.

Solve the equation. Check your solution.

17. $24x + 16 = 12$
18. $-6y + 15 = -9$
19. $4(q - 5) = 16$
20. $7m + 38 = -5m - 16$
21. $48j + 25 = 12j - 11$
22. $8(2n - 5) = 3(6n - 2)$
23. **SALES TAX** You buy a jacket, and the sales tax is 6%. The total cost is \$79.49. Find the cost of the jacket before the tax.
24. **FOOD SHOPPING** At a vegetable stand, you bought 3 pounds of peppers for \$4.50. Green peppers cost \$1 per pound and orange peppers cost \$4 per pound. Find how many pounds of each kind of pepper you bought.

Solve the equation for y. Then find the value of y for the given value of x.

25. $10x + y = 7; x = 3$
26. $8y - 3x = 18; x = 2$
27. $xy - 6y = -15; x = 5$
28. $4x = 6y + 9; x = 9$
29. $5x - 2y = 10; x = -6$
30. $x - 3xy = 1; x = -5$
31. **GEOMETRY** The formula $S = 2\pi rh + 2\pi r^2$ gives the surface area S of a cylinder with height h and radius r. Solve the formula for h. Find h if $r = 5$ centimeters and $S = 400$ square centimeters.

32. **AVERAGE SPEED** It takes 3 hours for a train to travel 175 miles. What is the average speed of the train?

33. **CAR RENTAL** While on vacation, your family rented a car for $293. The car rental cost $180, plus $.25 for every mile driven over 150 miles. How many miles did you drive while on vacation?

Solve the inequality. Then graph the solution.

34. $2x - 3 < -1$

35. $7 - 3x \geq -11$

36. $15x + 8 > 9x - 22$

37. $13x + 24 \leq 16 - 3x$

38. $-5 < 10 - x < 5$

39. $-8 \leq 3x + 1 \leq 10$

40. **GEOMETRY** A triangle has sides of lengths 10, $2x$, and $3x$. The sum of the lengths of any two sides is greater than the length of the third side. Write and solve three inequalities to find the possible values of x.

Solve the equation. Check for extraneous solutions.

41. $|3p + 2| = 7$

42. $|9q - 5| = 2q$

43. $|8r + 1| = 3r$

Solve the inequality. Then graph the solution.

44. $|x - 5| \geq 1$

45. $|5 - 2y| > 7$

46. $|6z + 5| \leq 25$

47. **VOLLEYBALL** The circumference of a volleyball should be 26 inches, with a tolerance of 0.5 inch. Write and solve an absolute value inequality that describes the acceptable circumferences of a volleyball.

Algebra 2 CH 2 Review

1. Copy and complete: The linear equation $5x - 4y = 16$ is written in __?__ form.
2. Copy and complete: A set of data pairs (x, y) shows a __?__ correlation if y tends to decrease as x increases.
3. Copy and complete: Two variables x and y show __?__ if $y = ax$ and $a \neq 0$.
4. **WRITING** *Explain* what distinguishes a function from a relation.

Consider the relation given by the ordered pairs. Identify the domain and range. Then tell whether the relation is a function.

5. $(-2, -2), (-1, 0), (2, 6), (3, 8)$
6. $(-1, -5), (1, 2), (3, 4), (1, -7)$
7. Tell whether $f(x) = 16 - 7x$ is a linear function. Then find $f(-5)$.

Find the slope of the line passing through the given points.

8. $(-2, -1), (4, 3)$
9. $(1, -5), (1, 2)$
10. $(5, -3), (1, 7)$
11. $(6, 2), (-8, 2)$

Graph the equation.

12. $y = 5 - x$
13. $y - 5x = -4$
14. $x = 4$

Write an equation of the line that passes through the given points.

16. $(-3, 4), (2, -6)$
17. $(-4, 5), (12, -7)$
18. $(-4, 1), (3, -6)$

The variables x and y vary directly. Write an equation that relates x and y. Then find y when $x = 3$.

19. $x = 6, y = -48$
20. $x = -9, y = 15$
21. $x = -3, y = 2.4$

22. **PHYSICS** Charles's Law states that when pressure is constant, the volume V of a gas varies directly with its temperature T (in kelvins). A gas occupies 4.8 liters at a temperature of 300 kelvins. Write an equation that gives V as a function of T. What is the volume of the gas when the temperature is 420 kelvins?

Approximate the best-fitting line for the data.

23.

x	−2	−1	0	1	2	3	4	5
y	4	3	2.5	2	0.5	−1	−2	−3

Graph the function. *Compare* the graph to the graph of $y = |x|$.

24. $y = |x - 3| + 2$
25. $y = \frac{3}{4}|x|$
26. $f(x) = -4|x + 2| + 3$

Tell whether the given ordered pair is a solution of the inequality.

28. $-y \leq 5x$; $(0, 1)$
29. $y > -3x - 7$; $(-4, 6)$
30. $3x - 4y < -8$; $(-2, 0)$

Graph the inequality in a coordinate plane.

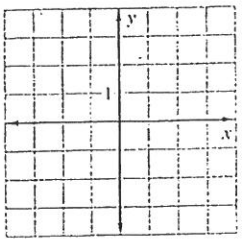
31. $-4y < 16$
32. $y - 2x > 8$
33. $12x - 8y \leq 24$

ALGEBRA 2 CHAPTER 3 REVIEW

1. Graph the linear system and estimate the solution.

$y = 2x - 1$

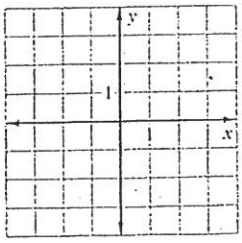
$y = -x + 1$



2. Solve the system by graphing. Then classify the system as *consistent and independent*, *consistent and dependent*, or *inconsistent*.

$-x + y = -2$

$2x - 2y = 4$



Solve the system using any algebraic method.

3. $2x - y = 4$
   $-x + 3y = 8$

4. $3x + 2y = -3$
   $-2x - 3y = 7$

5. $0.9x + 0.9y = 4.5$
   $13x - 13y = 91$

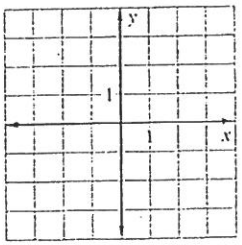
6. $2x + y = 4$
   $3x - 2y = -1$

7. A paint company wants to make a 40% solution from a 25% solution and 50% solution of a chemical. How many gallons of the 25% and 50% mixture do they need to make 100 gallons of the 40% mixture?

8. Graph the system of inequalities.

$y > 2|x + 1| - 2$

$y < -|x + 1| - 1$



Solve the system using any algebraic method.

9. $2x + y - z = 4$
   $-x - 3y + 3z = 3$
   $3x + 4y - 4z = 1$

10. $x + 2y - 2z = 4$
    $3x - y - z = 6$
    $-4x - y + 3z = -10$

11. Tom, Bob, and Joe are brothers. Their combined ages are 47. Joe was born 3 years before Bob and 4 years after Tom. How old is each brother?

Answers

1. See left.
2. See left.
3. _____
4. _____
5. _____
6. _____
7. _____
8. See left.
9. _____
10. _____
11. _____

12. Perform the indication operation, if possible. If not possible, state the reason.

$$2\begin{bmatrix} 2 & -1 & 0 \\ -2 & 3 & 1 \end{bmatrix}\begin{bmatrix} -3 & -2 & 2 \\ 1 & 0 & 3 \end{bmatrix}$$

13. Solve the matrix equation for x and y.

$$\begin{bmatrix} 2 & x & 3 \\ 1 & -2 & 1 \end{bmatrix} - \begin{bmatrix} 1 & -4 & 0 \\ -2 & -3 & y \end{bmatrix} = \begin{bmatrix} 1 & 4 & 3 \\ 3 & 1 & -1 \end{bmatrix}$$

Find the product. If it is not defined, state the reason.

14. $\begin{bmatrix} 2 & 1 \end{bmatrix}\begin{bmatrix} 3 & -2 & 0 \\ 1 & -4 & -1 \end{bmatrix}$

15. $\begin{bmatrix} 1 & 2 \\ 0 & 1 \end{bmatrix}\begin{bmatrix} 1 & 2 & 3 & -2 \\ -1 & -1 & 0 & 1 \end{bmatrix}$

16. Using the given matrix, find $A^2 = AA$ and $A^3 = AAA$.

$$A = \begin{bmatrix} 0 & -1 \\ -1 & 0 \end{bmatrix}$$

17. You went to the post office and sent 4 items first class, 9 items second-class, and 33 items bulk mail. First class costs $3.25 per package, second class costs $1.75 per package, and bulk mail costs $.23 per package. Organize the information using matrices. Then use matrix multiplication to find the total dollar amount spent at the post office.

Evaluate the determinant of the matrix.

18. $\begin{bmatrix} -2 & 2 & 3 \\ -1 & 2 & 1 \\ 0 & -2 & 1 \end{bmatrix}$

19. $\begin{bmatrix} 3 & 4 & -1 \\ 5 & -3 & -2 \\ 4 & 0 & -3 \end{bmatrix}$

20. On a recent vacation, your uncle spent a total of $680 on airfare, hotel, and a rental car. The airfare cost twice as much as hotel, and the rental car was one-third as much as the hotel. Use a linear system and Cramer's Rule to find how much your uncle paid for each service.

Augmented

Use an ~~inverse~~ matrix to solve the linear system.

21. $3x + y = 7$
$-2x + 6y = 2$

22. $4x - 3y = -4$
$-2x - 2y = -12$

Answers

12. _____

13. _____

_____

14. _____

15. _____

16. _____

_____

17. _____

18. _____

19. _____

20. _____

_____

_____

21. _____

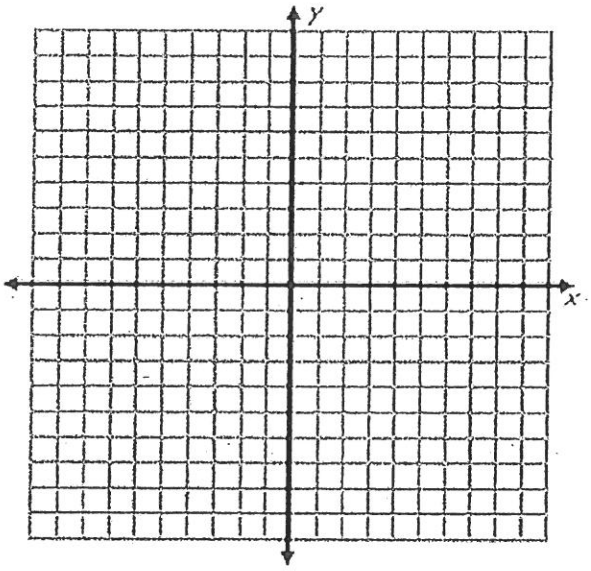
22. _____

NAME:_____ DATE: _____

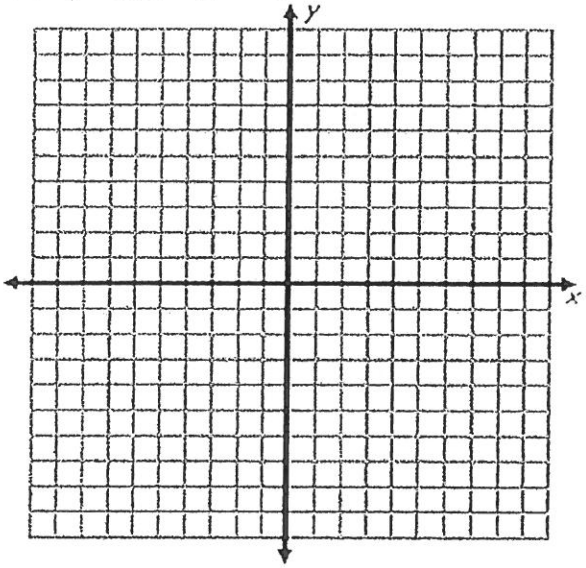
Algebra 2
CHAPTER 4 REVIEW

Directions: Graph and solve the quadratic functions

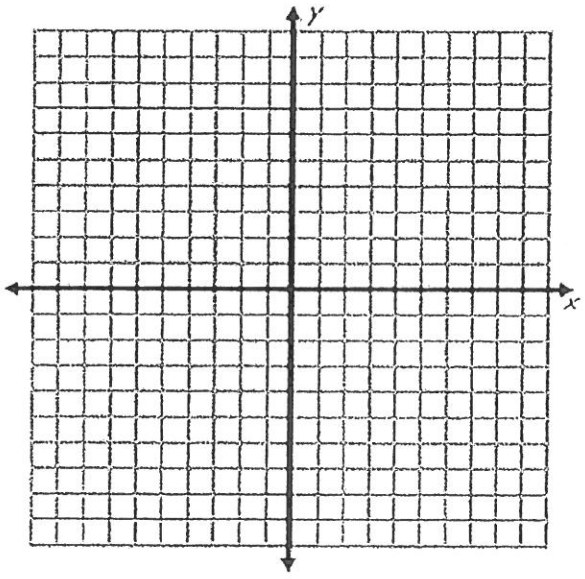
1. $y = x^2 - 4x + 5$



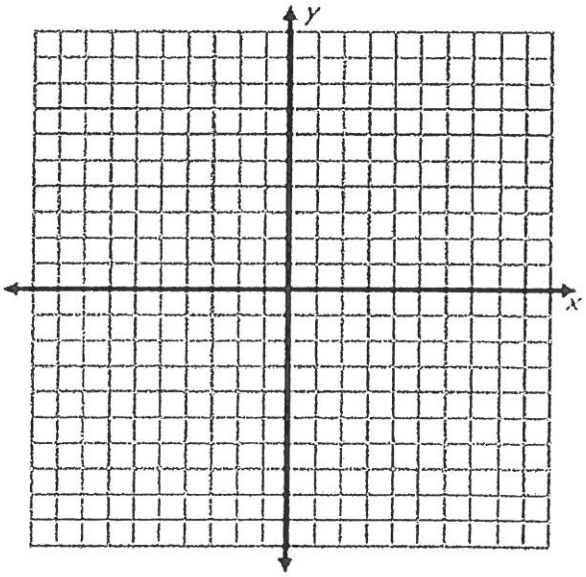
2. $y = 2(x + 1)^2 - 4$



3. $y = -2x^2 - 2x + 24$

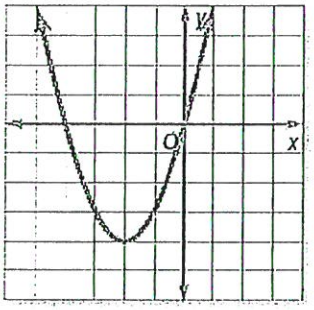


4. $y = (x + 3)^2 + 2$

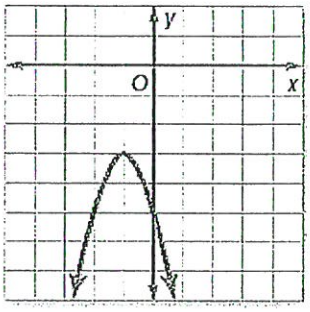


Directions: Use the graph to determine the solutions.

5. $x^2 + 4x = 0$



6. $-2x^2 - 4x - 5 = 0$



Directions: Factor and solve the following quadratic equations.

7. $18x^2 + 15x - 12 = 0$

8. $15x^2 + 7x - 2 = 0$

9. $x^2 + 3x - 18 = 0$

10. $2x^2 - 17x + 45 = 3x - 5$

Directions: Simplify.

11. $\sqrt{48}$

12. $\sqrt{-72}$

13. $\sqrt{-49}$

14. $\sqrt{-12}$

15. $(8 + 9i) + (2 - 6i)$

16. $(4 + 3i) - (1 + 8i)$

17. $(3 + 2i)(2 - 5i)$

18. $(4 - i)(6 - 6i)$

19. $(7 - \sqrt{6})(2 + \sqrt{18})$

20. $(3 + \sqrt{-12})(2 + \sqrt{2})$

Directions: Simplify.

21. $\frac{3}{3-2i}$

22. $\frac{2i}{(5+4i)}$

23. $\frac{3}{\sqrt{5}}$

24. $\frac{2+\sqrt{6}}{\sqrt{3}}$

25. $\frac{4}{2+\sqrt{7}}$

26. $\frac{-1}{3-\sqrt{2}}$

27. $|7+9i| =$

28. $|-4-8i| =$

Directions: Solve the following equations.

29. $4x^2 - 48 = 0$

30. $2x^2 + 50 = 0$

31. $x^2 - 14x + 49 = -9$

32. $16x^2 + 72x + 81 = 24$

Directions: Use completing the square to solve.

33. $3x^2 - 6x + 12 = 0$

34. $x^2 - 2x + 8 = 0$

35. $2x^2 - 12x = -14$

36. $2x^2 + 6x - 8 = 10$

Directions: Use the quadratic formula to solve.

37. $3x^2 - 11x - 4 = 0$

38. $8x^2 + 4x + 5 = 0$

39. $x^2 + 4x + 30 = 10$

40. $x^2 = 8x - 35$

41. $2x^2 + 3x - 18 = 0$

42. $2x^2 + 5x + 9 = 0$

Directions: Rewrite the following quadratic equation in vertex form. Then state the vertex.

43. $y = 2x^2 + 12x - 8$

44. $y = 3x^2 + 36x + 25$