Name: _____ Class: _____ Date: _____ ID: A

Algebra 2 Summer Packet - 1 Test Grade

Multiple Choice
Identify the choice that best completes the statement or answers the question.

_____ 1. Select the algebraic expression that represents the verbal expression *twice the sum of a number and 8*.
   a. $2n + 8$ b. $n + 16$ c. $2(n + 8)$ d. $2n + 28$

_____ 2. Evaluate $2b(4a - c^2)$ if $a = 5$, $b = \dfrac{3}{2}$, and $c = 11$.

   a. -303 b. 423 c. -6 d. $-\dfrac{303}{2}$

_____ 3. Evaluate $-|3c - d|$ if $c = -1$ and $d = 5$.
   a. 8 b. 2 c. -7 d. -8

_____ 4. The formula for the surface area of a sphere is $A = 4\pi r^2$, where r is the length of the radius. Find the surface area of a sphere with a radius of 14 feet. Use $\dfrac{22}{7}$ for π.

   a. 7248 ft^2 b. 7744 ft^2 c. 2464 ft^2 d. 704 ft^2

_____ 5. Name the sets of numbers to which $-\dfrac{1}{3}$ belongs.

   a. naturals, rationals c. integers, rationals
   b. rational, reals d. integers, rationals, reals

_____ 6. Simplify $\dfrac{1}{3}(15x - 9) + \dfrac{1}{5}(25x + 5)$.

   a. $10x - 2$ b. $5x - 2$ c. $\dfrac{64}{3}x - \dfrac{32}{15}$ d. $\dfrac{1}{5}(40x - 4)$

_____ 7. Name the property illustrated by $5(x + y) = 5(y + x)$.
   a. Commutative Property of Multiplication
   b. Distributive Property
   c. Commutative Property of Addition
   d. Associative Property of Addition

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Solve each equation.

_____ 8. $23 = 5 - \frac{2}{3}m$

     a.   −42   b.   −12   c.   −27   d.   42

_____ 9. $18 = 3\,|\,4x - 10\,|$

     a. $\{1, -1\}$ b. $\{1, 4\}$ c. $\{4, -4\}$ d. $\{4\}$

_____ 10. $5(2x - 6) = 7x - 3$

     a.   −9   b.   9   c.   11   d. $\varnothing$

_____ 11. $|\,x - 3\,| + 10 = 2$

     a. $\{-5\}$ b. $\{-5, 11\}$ c. $\{11\}$ d. $\varnothing$

_____ 12. Jamie is 4 years younger than her brother. Five years from now, the sum of their ages will be 32. Find Jamie's present age.

     a.   9   b.   10   c.   13   d.   14

_____ 13. One side of a triangle is four centimeters longer than the shortest side. The third side of the triangle is twice as long as the shortest side. Find the length of the longest side of the triangle if its perimeter is 40 centimeters.

     a.   9 cm   b.   13 cm   c.   24 cm   d.   18 cm

Solve each inequality.

_____ 14. $0.38 > \dfrac{2x - 7}{5}$

     a. $x < 4.45$ b. $x < 98.5$ c. $x < 13$ d. $x < 3.69$

_____ 15. $9 \le 7 - x \le -1$

     a. $-2 \le x \le 8$ c. $x \le -2$ or $x \ge 8$

     b. $\varnothing$ d. $x \le -2$

_____ 16. $5x - 4 \ge 26$ or $29 - 3x > 2$

     a. $6 + x < 9$ c. $x \le 6$ or $x > 9$

     b.   all real numbers   d. $x - 9$

_____ 17. $|2x - 3| + 7$

   a. $x \le 5$ c. $-2 \le x \le 5$

   b. $-5 \le x \le 5$ d.   all real numbers
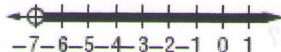
_____ 18. $2|m + 7| > 8$

   a. $-11 < m < -3$ c.   all real numbers
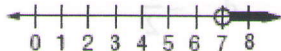
   b. $m < -13$ or $m > -1$ d. $m < -11$ or $m > -3$

_____ 19. Identify the graph of the solution set of $-2.3 < 4 + 0.9y$.
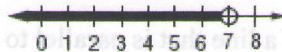
   a.

   c.

   b.

   d.

_____ 20. One number is four times a second number. If you take one-half of the second number and increase it by the first number, the result is at least 45. Find the least possible value for the second number.

   a.   10   b.   9   c.   11   d.   12

_____ 21. Find the range of the relation $\{(-1, 4), (2, 5), (3, 5)\}$. Then determine whether the relation is a function.

   a. $\{-1, 2, 3\}$; function   c. $\{4, 5\}$; function

   b. $\{-1, 2, 3\}$; not a function   d. $\{4, 5\}$; not a function

_____ 22. Find $f(-1)$ if $f(x) = \dfrac{x^2 - 6x}{x + 2}$.

   a. -5 b. $-\dfrac{5}{3}$ c. $\dfrac{7}{3}$ d.   7

_____ 23. Find $f(a)$ if $f(t) = 2t^2 - t - 2$.

   a. $2(t + a)^2 - 2t + a - 2$ c. $2a^2 - a - 2$

   b. $2(t + a)^2 - 2(t + a) - 2$ d. $4a^2 - 2a - 2$

_____ 24. Which equation is linear?

   a. $x = -2$ b. $y = 3x2 + 1$ c. $y < 5x - 2$ d. $y2 = \_1\,2\,x + 3$

_____ 25. Write $-3y = -1 + 5x$ in standard form.

   a. $-5x - 3y = 1$ c. $y = -\dfrac{5}{3}x - 1$

   b. $5x + 3y = 1$ d. $3x + 5y - 1 = 0$

_____ 26. Find the x–intercept of the graph of $4x - 2y = 8$.

a. -4 b. -2 c. 0 d. 2

_____ 27. Find the slope of a line that passes through (2, 4) and (–7, 8).

a. $-\frac{4}{9}$ b. $-\frac{4}{5}$ c. $\frac{5}{4}$ d. $-\frac{9}{4}$

_____ 28. What is the slope of the line $x = -2$?

a. -2 b. 0 c. $\frac{1}{2}$ d. undefined

_____ 29. What is the slope of a line that is parallel to the graph of $2x - 3y = 6$?

a. $\frac{3}{2}$ b. $-\frac{2}{3}$ c. $\frac{2}{3}$ d. $-\frac{3}{2}$

_____ 30. The graph of the line through (2, 3) that is perpendicular to the line with equation $x = -1$ also goes through which point?

a. $(0, -1)$ b. $(-2, 3)$ c. $(2, -4)$ d. $(1, 4)$

_____ 31. Write an equation in slope–intercept form for the line that has a slope of 3 and passes through (–1, 2).

a. $y = 3x - 1$ b. $y = 3x - 5$ c. $y = 5x + 3$ d. $y = 3x + 5$

_____ 32. Write an equation in slope–intercept form for the line that passes through (–1, –2) and (3, –7).

a. $y = \frac{5}{4}x - \frac{3}{4}$

c. $y = \frac{4}{5}x - \frac{6}{5}$

b. $y = -\frac{4}{5}x - \frac{6}{5}$

d. $y = -\frac{5}{4}x - \frac{13}{4}$

_____ 33. Write an equation in slope–intercept form for the line that passes through (0, –2) and is parallel to the line whose equation is $3x + 5y =$

a. $y = -\frac{3}{5}x - 2$

c. $y = \frac{3}{5}x + 2$

b. $y = 3x - 2$

d. $y = -3x + 2$

_____ 34. The table below shows the relationship between the number of hours practiced and the number of free throws made for 5 players. Use a scatter plot to draw a line of fit and then describe the correlation.

Hours Practiced	1	3	4	7	12
Free Throws Made	0	4	6	16	19

a. positive   c. no correlation

b. negative   d. random correlation

_____ 35. Which equation could be a prediction equation for the data points shown in the scatter plot at below?
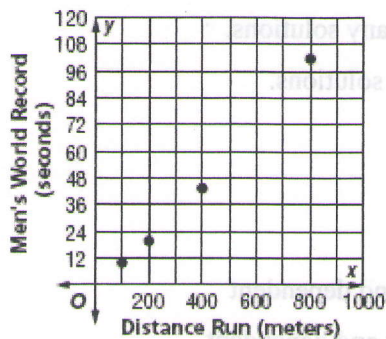
Source: *The World Almanac*

a. $y = 10x - 6$ c. $y = x + 6$

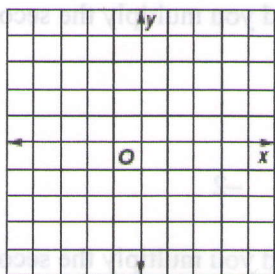b. $y = -\dfrac{1}{10}x + 6$ d. $y = \dfrac{1}{10}x - 6$

_____ 36. Identify the type of function represented by the equation $y = -3$.

a.   constant   c.   absolute value

b.   identity   d.   quadratic

_____ 37. Identify the domain of $y = 3\,|x + 2|$.

a.   all real numbers   c. $\{y \,|\, y \geq 0\}$

b. $\{x \,|\, x \geq 2\}$ d. $\{y \,|\, y \geq 2\}$

_____ 38. Which is not part of the definition of the piecewise function shown?

a. 2 if $x \leq -1$ c. $-x + 1$ if $-1 \leq x < 1$

b. $x + 1$ if $-1 < x < 1$ d. $2x$ if $x \geq 1$

_____ 39. The graph of the linear inequality $y \; ? \; 3x - 1$ is the region _____?_____ the graph of $y = 3x - 1$.

a.   above   b.   below   c.   on or above   d.   on or below

_____ 40. Which inequality describes the situation when Bob has at least 3 pets?

a. $p > 3$ b. $p \geq 3$ c. $3 > p$ d. $p \leq 3$

_____ 41. The system of equations $y = 2x - 3$ and $y = 4x - 3$ has

    a. exactly one solution.   c. infinitely many solutions.

    b. no solution.   d. exactly two solutions.

_____ 42. Choose the correct description of the system of equations.

$$x + 2y = 7$$
$$3x - 2y = 5$$

    a. consistent and independent   c. consistent and dependent

    b. inconsistent   d. inconsistent and dependent

To solve each system of equations, which expression could be substituted for x into the first equation?

_____ 43. $3x - 5y = 14$
        $x + 4y = 10$

    a. $10 - 4y$ b. $\frac{1}{4}x + \frac{5}{2}$ c. $4y + 10$ d. $-\frac{1}{4}x + \frac{5}{2}$

_____ 44. $2x + 7y = 10$
        $x - 2y = 15$

    a. $\frac{1}{2}x + 15$ b. $2y + 15$ c. $\frac{1}{2}x + 15$ d. $2y - 15$

_____ 45. The first equation of the system is multiplied by 2. By what number would you multiply the second equation to eliminate the x variable by adding?

$$6x - 5y = 21$$
$$4x + 7y = 15.$$

    a. 3   b. −3   c. 2   d. −2

_____ 46. The first equation of the system is multiplied by 4. By what number would you multiply the second equation to eliminate the y variable by adding?

$$2x + 5y = 16$$
$$8x - 4y = 10$$

    a. 5   b. −5   c. 2   d. −2
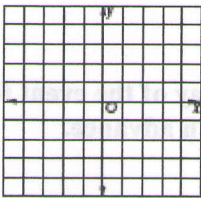
Solve each system of equations.

_____ 47. $4x - 3y = 14$
$y = -3x + 4$

    a. (1, 1)   b. (−4, −10)   c. (5, 2)   d. (2, −2)

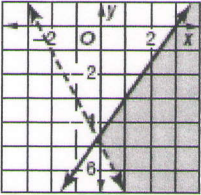_____ 48. $4x - 3y = 8$
$2x + 5y = -9$

    a. (−2, 1)   b. (0, −83)   c. (2, 0)   d. $(\frac{1}{2}, -2)$

_____ 49. Which system of equations is graphed?

    a. $2x + y = 2$ b. $2x + y = -2$ c. $2x + y = 2$ d. $2x + y = -2$
       $-3x - y = 4$ $3x - y = 4$ $3x - y = 4$ $-3x - y = 4$

_____ 50. Which system of inequalities is graphed?

    a. $2x + y \geq 5$ b. $2x + y > -5$ c. $2x - y \leq 5$ d. $-2x + y > 5$
       $3x + 2y \leq 9$ $3x - 2y \geq 9$ $3x + 2y < 9$ $3x - 2y \leq 9$

_____ 51. Find the coordinates of the vertices of the figure formed by the system $x \geq 0$, $y \geq -2$, and $2x + y \leq 4$.

    a. (3, −2), (0, 4), (0, −2)   c. (0, 0), (0, 4), (2, 0)

    b. (−2, 0), (4, 0), (−2, 3)   d. (−2, 3), (0, 4), (0, −2)

Use the system of inequalities $y \geq 1$, $y - x \leq 6$, and $x + 2y \leq 6$.

_____ 52. Find the coordinates of the vertices of the feasible region.

    a. (−6, 0), (−2, 4), (6, 0)   c. (−5, 1), (−2, 4), (4, 1)

    b. (0, 1), (0, 3), (4, 1)   d. (−5, 1), (−2, 4), (0, 3), (0, 1)

_____ 53. Find the maximum value of $f(x, y) = 2x + y$ for the feasible region.

    a. 0   b. 11   c. 9   d. 8

_____ 54. Find the minimum value of $f(x, y) = 2x + y$ for the feasible region.

    a. −10   b. 0   c. −9   d. −4

_____ 55. What is the value of z in the solution of the system of equations?

$$2x + 3y - z = 12$$
$$4x - y + z = 3$$
$$-2x + 2y + z = 3$$

    a. −1   b. $\dfrac{3}{2}$ c. 3   d. 0

Tickets to a golf tournament are sold in advance for $40 each, and on the day of the event for $50 each. For the tournament to occur, at least 2000 of the 8000 tickets must be sold in advance.

_____ 56. Let a represent the number of advance tickets sold and d represent the number sold on the day of the tournament. Which system of inequalities represents the number of tickets sold?

    a. $a \ge 2000, d \ge 0, a + d \le 8000$ c. $a \ge 0, d \ge 0, a + d \le 8000$

    b. $a \ge 0, d \ge 0, a + d \le 2000$ d. $a \le 40, d \le 50, a + d \le 2000$

_____ 57. How many advance tickets should be sold to maximize revenue?

    a. 6000   b. 2000   c. 4000   d. 8000

A local gas station sells low-grade (ℓ), mid-grade (m), and premium (p) gasoline. Mid-grade gasoline costs $0.10 per gallon more than low-grade, and premium gasoline costs $0.10 per gallon more than mid-grade gasoline. Five gallons of low-grade gas cost $18.

_____ 58. Which system of equations represents the cost of each type of gasoline?

    a. $5\ell + m = 18, m = \ell + 0.10, p = m + 0.10$

    b. $5\ell = 18, m = \ell - 0.10, p = m - 0.10$

    c. $5\ell = 18, m = \ell + 0.10, p = m + 0.10$

    d. $0.10\ell + 0.10m + 5p = 18, 0.10\ell + m = 0, 0.10m + p = 0$

_____ 59. What is the cost of one gallon of premium gasoline?

    a. $3.60   b. $3.70   c. $3.80   d. $3.90

_____ 60. Choose the correct description of the system of equations.

$2x + 3y = 10$
$4x + 6y = 20$

a. consistent and independent

b. inconsistent

c. consistent and dependent

d. inconsistent and dependent