Name:_____ Class:_____ Date:_____

College Algebra Summer Assignment

Indicate the answer choice that best completes the statement or answers the question.

Solve each equation or inequality.

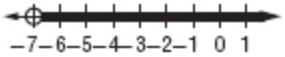
___ 1. $5(2x - 6) = 7x - 3$

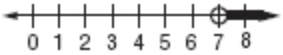
a. –9 b. 11 c. 9 d. ∅

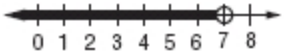
___ 2. $0.38 > \dfrac{2x - 7}{5}$

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

___ 3. Identify the graph of the solution set of $-2.3 < 4 + 0.9y$.

a. 

b. 

c. 

d. 

___ 4. What is the slope of a line that is parallel to the graph of $2x + 3y = 5$?

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

___ 5. Write an equation in slope-intercept form for the line that has a slope of –4 and passes through (1, 2).

a. $y = -2x + 4$ b. $y = -4x + 6$ c. $y = -4x + 2$ d. $y = -4x + 9$

___ 6. The system of equations $y = -3x + 5$ and $y = 3x - 7$ has

a. exactly one solution. b. no solution.

c. infinitely many solutions. d. exactly two solutions.

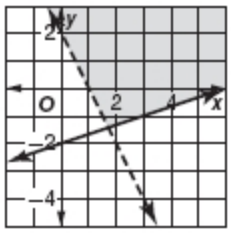
Choose the correct description of each system of equations.

___ 7. $2x - y = 4$
$4x - 2y = 6$

a. consistent and independent b. inconsistent

c. consistent and dependent d. inconsistent and dependent

___ 8. Which system of inequalities is graphed?



a. $2x - y \geq 2$ b. $2x + y \geq 2$ c. $2x + y > 2$ d. $2x - y < 2$
$x + 3y < 6$ $x - 3y < 6$ $x - 3y \leq 6$ $x + 3y \leq 6$

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Use the system of inequalities $x \geq 2$, $y - x \geq -3$, and $x + y \leq 5$.

___ 9. Find the maximum value of $f(x, y) = x - 4y$ for the feasible region.

a. 14 b. 0 c. 8 d. 6

At a university, 1200 students are enrolled in engineering. There are twice as many in electrical engineering as in mechanical engineering, and three times as many in chemical engineering as there are in mechanical engineering.

___ 10. Which system of equations represents the number of students in each program?

a. $c + m + e = 1200, 2m = e, 3m = c$ b. $c + m + e = 1200, 2e = m, 3c = m$

c. $c + m + e = 1200, 3m = e, 2m = c$ d. $c + m + e = 1200, 2m = e, 3m = 2e$

___ 11. The table shows the relationship (x, y) between height and growing times for 5 plants of the same species. Find the range of the relation. Then determine whether the relation is a function.

Height (inches), x	15	18	19	20	23
Growing Time (weeks), y	8	14	16	17	19

a. {15, 18, 19, 20, 23}; not a function b. {15, 18, 19, 20, 23}; function

c. {8, 14, 16, 17, 19}; not a function d. {8, 14, 16, 17, 19}; function

___ 12. Identify the range of $y = |x| - 4$.

a. $x \geq 4$ b. $y \geq -4$

c. $y \geq 0$ d. all real numbers

___ 13. Find $f(-1)$ if $f(x) = \dfrac{x^2 - 4}{x + 2}$.

a. –5 b. –3 c. 1 d. 3

___ 14. Which function is a linear function?

a. $f(n) = \sqrt{n - 2}$

b. $g(k) = 2 + 7k$

c. $h(m) = \dfrac{1}{m}$

d. $f(a) = -a^3 - 3a$

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Use the function $y = \frac{3}{2}x - 6$.

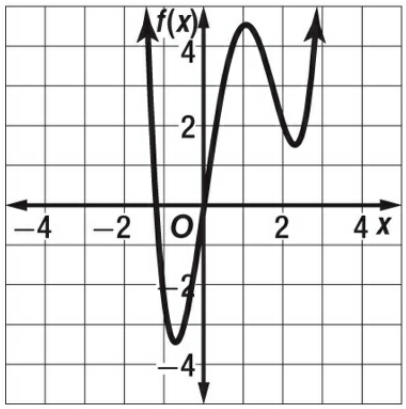
___ 15. Find the x-intercept of the graph of the function.

a. –6
b. –3
c. 2
d. 4

___ 16. Describe the transformation in $y = | x + 5 |$.

a. translation of $y = | x |$ left 5 units
b. translation of $y = | x |$ right 5 units
c. translation of $y = | x |$ up 5 units
d. translation of $y = | x |$ down 5 units

Use the graph.



___ 17. Determine the values of x between which a real zero is located.

a. between 1 and 2
b. between –2 and –1
c. between –4 and –3
d. between 2 and 3

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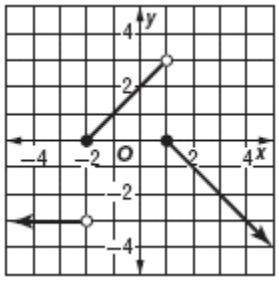
___ 18. Which is *not* part of the definition of the piecewise function shown?



a. $f(x) = -3$ if $x < -2$ b. $f(x) = x + 2$ if $-2 \leq x < 1$

c. $f(x) = x - 3$ if $x < -2$ d. $f(x) = -x + 1$ if $x \geq 1$

___ 19. Identify the type of special function represented by the equation $y = |x| - 3$.

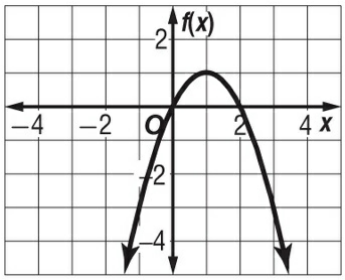
a. step

b. piecewise

c. absolute value

d. quadratic

___ 20. Which statement is true about the graph?



a. The graph has point symmetry at (1, 1).

b. The graph has point symmetry at (2, 0).

c. The graph has line symmetry at $x = 1$.

d. The graph has line symmetry at $x = 2$.

___ 21. Identify the y-intercept and the axis of symmetry for the graph of $f(x) = 10x^2 + 40x + 42$.

a. 42; $x = 4$ b. 0; $x = -4$ c. 42; $x = -2$ d. –42; $x = 2$

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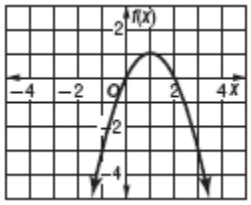
___ 22. Identify the quadratic function graphed below.



a. $f(x) = -x^2 - 2x$ b. $f(x) = -x^2 + 2x$

c. $f(x) = x^2 - 2x$ d. $f(x) = -(x + 2)^2$

___ 23. Determine whether $f(x) = 4x^2 - 16x + 6$ has a maximum or a minimum value and find that value.

a. minimum; –10 b. minimum; 2

c. maximum; –10 d. maximum; 2

___ 24. Which equation has no real roots?

a. $x^2 - 9 = 0$ b. $x^2 - 3x + 9 = 0$

c. $x^2 + 6x + 5 = 0$ d. $x^2 + 10x = 0$

___ 25. Solve $x^2 - 3x = 18$ by factoring.

a. {6} b. {–6, 3} c. {–9, 2} d. {–3, 6}

___ 26. Simplify $(4 - 12\boldsymbol{i}) - (-8 + 4\boldsymbol{i})$.

a. 12 – 8 b. 28 c. $12 - 16\boldsymbol{i}$ d. $12 + 16\boldsymbol{i}$

___ 27. Solve $x^2 - 14x + 49 = 20$ by using the Square Root Property.

a. $x = -7 \pm \sqrt{5}$ b. $x = 7 \pm \sqrt{5}$

c. $x = -7 \pm 2\sqrt{5}$ d. $x = 7 \pm 2\sqrt{5}$

___ 28. Solve $x^2 + 10x + 23 = 0$ by completing the square.

a. $x = -5 \pm \sqrt{2}$ b. $x = 5 \pm \sqrt{2}$

c. $x = -2 \pm \sqrt{5}$ d. $x = 2 \pm \sqrt{5}$

Use the value of the discriminant to determine the number and type of roots for each equation to answer the following questions.

___ 29. $x^2 + 20 = 12x - 16$

a. 1 real, irrational b. no real

c. 2 real, rational d. 1 real, rational

___ 30. Solve $x^2 \geq 2x + 24$.

a. $\{x \mid -4 \leq x \leq 6\}$ b. $\{x \mid x \leq -6 \text{ or } x \geq 4\}$

c. $\{x \mid -6 \leq x \leq 4\}$ d. $\{x \mid x \leq -4 \text{ or } x \geq 6\}$

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___ 31. Simplify $(3a^0b^2)(2a^3b^2)^2$.

a. $12a^6b^6$ b. $36a^6b^8$ c. $6b^8$ d. $12ab^6$

___ 32. Max is simplifying the expression $(2x^5 - 5x^3)(x^4 + 3x^2 - 4)$. Which of the following shows the correct product?

a. $2x^9 - x^7 + 23x^5 - 20x^3$

b. $2x^{20} - 6x^{10} + 8x^5 + 5x^{12} + 15x^6 - 20x^3$

c. $2x^9 - x^7 + 23x^5 - 20x^3$

d. $2x^9 + x^7 - 23x^5 + 20x^3$

___ 33. Simplify $(3a^3 - 7a^2 + a) - (6a^3 - 4a^2 - 8)$.

a. $-3a^6 - 3a^4 + a + 8$ b. $-3a^6 - 11a^4 + a - 8$

c. $-3a^3 - 11a^2 + a - 8$ d. $-3a^3 - 3a^2 + a + 8$

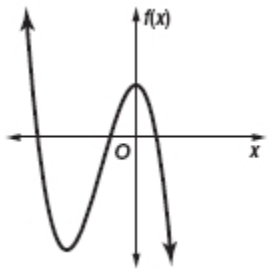
___ 34. Use the Binomial Theorem to find the third term in the expansion of $(x + 3y)^6$.

a. $15x^4y^2$ b. $135x^4y^2$ c. $540x^3y^3$ d. $20x^3y^3$

___ 35. Find $p(-4)$ if $p(x) = 3x^2 - 2x^2 + 6x - 4$.

a. –252 b. –140 c. 132 d. 180

___ 36. State the number of real zeros for the function whose graph is shown below.



a. 0 b. 2 c. 3 d. 1

___ 37. Use synthetic substitution to find $f(-2)$ for $f(x) = 2x^4 - 3x^3 + x^2 - x + 5$.

a. 15 b. 67 c. 63 d. 19

___ 38. One factor of $x^3 - 3x^2 - 4x + 12$ is $x + 2$. Find the remaining factors.

a. $x + 2, x + 3$ b. $x + 2, x - 3$ c. $x - 2, x + 3$ d. $x - 2, x - 3$

___ 39. Which describes the number and type of roots of the equation $x^4 - 64 = 0$?

a. 2 real roots, 2 imaginary roots b. 3 real roots, 1 imaginary root

c. 4 real roots d. 4 imaginary roots

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___ 40. State the possible number of imaginary zeros of $f(x) = 7x^3 - x^2 + 10x - 4$.
a. exactly 1 b. exactly 3 c. 3 or 1 d. 2 or 0