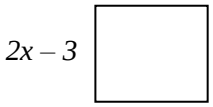
Name _____ Common Core Algebra Review

Part I: Select the letter of the correct response.

1. What are the zeros of the function $f(x) = x^2 - 5x - 6$?

   (a) {6, -1} (b) {-6, 1} (c) {-2, -3} (d) {2, -3}

2. Which expression represents the area of the square shown?

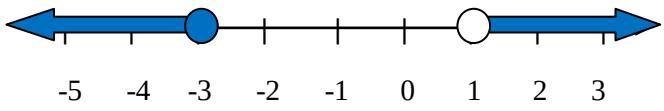


   (a) $4x^2 - 9$ (b) $8x - 12$ (c) $4x^2 - 12x + 9$ (d) $4x^2 - 6x - 9$

3. A taxi ride costs $2.50 for the first mile and $0.75 for each additional half-mile. If x represents the number of additional miles ridden, which function accurately represents the cost of a ride in this taxi?

   (a) $C(x) = 2.50 + 0.75(2x)$
   (b) $C(x) = 2.50 + 0.75(\frac{1}{2}x)$
   (c) $C(x) = 2.50 + 0.75(x + \frac{1}{2})$
   (d) $C(x) = 2.50 + 0.75(2x - 1)$

4. Which is the correct representation, in interval form, of the inequality shown in the graph below?



   (a) $(-\infty, -3] \cap (1,\infty)$ (b) $(-\infty, -3] \cup (1,\infty)$ (c) $[-3,1)$ (d) $(-3, 1]$

5. What is the domain of $f(x) = \sqrt{x+4}$?

   (a) $x \geq 4$ (b) $x \geq -4$ (c) $x \geq 0$ (d) $x \leq -4$

6. What point lies on the boundary line of $2x - 6y < 24$?

   (a) (2, 6) (b) (0, 0) (c) (–2, –6) (d) (6, –2)

7. Which could <u>not</u> represent the lengths of the sides of a right triangle?

   (a) 6, 9, 12 (b) 9, 12, 15 (c) 5, 13, 12 (d) $\sqrt{6}, \sqrt{6}, \sqrt{12}$

8. Which data set has the greatest variability from the center, as measured by its interquartile range?

   (a) 3, 4, 8, 8, 10, 12, 15
   (b) 2, 6, 7, 8, 9, 11, 20
   (c) 17, 18, 19, 20, 21, 22, 23
   (d) 20, 20, 20, 30, 30, 30, 30

9. Joe bought a car 6 years ago for $24,000. It has been depreciating at a rate of 19% per year. Which expression represents its current value?

   (a) $24{,}000\ (0.81)^6$ (b) $24{,}000\ (1.19)^6$ (c) $24{,}000\ (0.19)^6$ (d) $24{,}000\ (\frac{0.81}{6})$

10. Which of the following represents the sequence –3, –2, 0, 4, 12, 28?

(a) $a(n) = a(n–1)^2 + 4$ (b) $a(n) = 2 \cdot a(n–1) + 4$ (c) $a(n) = a(n–1)+(n+1)$ (d) $a(n) = 2 \cdot a(n–1) – 4$

11. What is the difference when $(2x^3 – 9x^2 + x – 4)$ is subtracted from $(x^3 – 6x^2 + 2)$?

(a) $x^3 – 3x^2 + x – 6$ (b) $x^3 – 15x^2 + x – 2$ (c) $–x^3 + 3x^2 – x + 6$ (d) $–x^3 – 15x^2 + x – 2$

12. What is the equation of a line perpendicular to $x + 3y = 6$ and passing through the point (0, –4)?

(a) $y = \frac{1}{3}x – 4$ (b) $y = -\frac{1}{3}x – 4$ (c) $y = 3x – 4$ (d) $–4y = 3x$

13. Which of the following functions is quadratic?

(a)

x	y
-2	-5
-1	-3
0	-1
1	1

(b)

x	y
0	1
1	2
2	5
3	10

(c)

x	y
0	0
1	4
4	16
9	36

(d)

x	y
-1	½
0	1
1	2
2	4

14. Which of the following represents an upward vertical shift of the parent function: $y = |x|$?

(a) $y = |x| + 2$ (b) $y = 2|x|$ (c) $y = |x + 2|$ (d) $y = |x – 2|$

15. What is the value of $f(–1)$ for the function defined as follows?

$$f(x) = \begin{cases} x + 5, & x < –3 \\ 2x, & –3 \le x < 1 \\ x – 4, & x \ge 1 \end{cases}$$

(a) 4 (b) –2 (c) –5 (d) It is undefined.

16. Two hot dogs and a soda cost $3.50. Three hot dogs and 2 sodas cost $5.75. What is the cost of a hot dog?

(a) $1.00 (b) $1.25 (c) $1.50 (d) $2.50

17. Which correctly describes the number and nature of the roots of $\boldsymbol{–x^2 – 8x + 10 = 0}$?

(a) No real roots (b) One rational root (c) Two rational roots (d) Two irrational roots

18. Which is an example of bivariate data?

(a) heights of all the boys in the 8th grade
(b) grades received on a math and a science test for one class of students
(c) ages of people at a conference
(d) favorite flavor of ice cream for all students in the school

Part II: Show work for each of the following questions.

1. Solve for x in the equation: $ax - b = cx + d$

2. Solve the inequality and graph the solution set on the number line: $|2x - 3| + 4 < 9$

3. Factor completely: $8x^3 + 4x^2 - 24x$

4. Simplify: $\dfrac{(-4x^2y)(2xy^3)^3}{16x^6y^4}$ *(only positive exponents in the answer)*

5. A football is thrown across a field. Its height (in feet) from the ground after t seconds is modeled by the equation:

$$h(t) = -16t^2 + 40t + 4$$

(a) What is the significance of the constant in the equation above?

(b) What is the maximum height that the football will reach?

(c) Assuming that the football goes across the field with no one catching or stopping it, how long will it take till it reaches the ground?

6. Given $\mathbf{y = ax^2 - 8x + 12}$, with axis of symmetry x = –2, find the value of a.

7. Solve the equation for x: $\frac{5}{x} - 4 = \frac{2}{3} + \frac{8}{3x}$

8. Draw a dot plot for the following data set. Calculate its mean and standard deviation.

80, 85, 85, 85, 88, 90, 93, 93, 95, 96

9. (a) Graph the functions on the same set of axes: $f(x) = 4 \cdot (\frac{1}{2})^x$ and $g(x) = 2x - 3$.

(b) Using your graph, state the coordinates of a point that satisfies the equation: $4 \cdot (\frac{1}{2})^x = 2x - 3$