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

ICM Unit 2 Test Review

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

____ 1. Which of the following is NOT true about the absolute value graph
a. Its domain is all real numbers
b. Its range is all real numbers
c. It is an even function
d. It is symmetric about the y-axis
e. All of the above are false

____ 2. Which of the following is true about the cubic function
a. Its domain is all real numbers
b. Its range is $[0,\infty)$
c. It is an even function
d. It is symmetric about the y-axis
e. All of the above are true

____ 3. Which of the following functions is neither even nor odd?
a. Quadratic
b. Square Root
c. Absolute Value
d. Cubic
e. Linear

____ 4. List the transformations needed to transform the graph of $y = f(x)$ to the graph of $g(x) = -f(x-1)+3$
a. Shift to the right 1 unit, reflect about the x-axis and shft down 3 units.
b. Shift to the right 1 unit, reflect about the x-axis and shift up 3 units
c. Shift to the right 1 unit, reflect about the y-axis and shift up 3 units.
d. Shift to the left 1 unit, reflect about the x-axis and sifht down 3 units
e. Shift to the left 1 unit, reflect about the y-axis and shift up 3 units

____ 5. In the function $f(x) = a(x-b)^2 + c$, where a, b, and c are positive real numbers, what happens to the graph of f as b increases?
a. The graph widens
b. The graph shifts left
c. The graph shifts right
d. The graph narrows

____ 6. What is the range of $f(x) = |x-3|+2$?

a. $[3,\infty)$
b. $[2,\infty)$
c. $(-\infty,\infty)$
d. $(-\infty,3]$
e. $(-\infty,2]$

____ 7. What is the domain of $f(x) = |x-3|+2$?

a. $[3,\infty)$
b. $[2,\infty)$
c. $(-\infty,\infty)$
d. $(-\infty,3]$
e. $(-\infty,2]$

____ 8. Which of the following function's domain excludes zero
a. Absolute value
b. Linear
c. Exponential
d. Cubic
e. Rational

____ 9. Which of the follwoing function's domain consists of only all postive numbers and zero?
a. Rational
b. Square Root
c. Absolute Value
d. Quadratic
e. Exponential

____ 10. Which of the following functions are symmetrical about the origin?
I. Linear
II. Rational
III. Square Root
a. I only
b. II only
c. III only
d. I and II
e. II and III

____ 11. Which functions are even?
I. Absolute Value
II. Square Root
III. Rational
a. I only
b. II only
c. III only
d. I and II
e. II and III

____ 12. Which of the following function's range excludes zero
a. Absolute value
b. Square Root
c. Exponential
d. Cubic
e. Quadratic

____ 13. The function(s) whose range is all real numbers
I. Linear
II. Quadratic
III. Cubic
a. I only
b. II only
c. III only
d. I and III
e. I and II

____ 14. Write $4x^3 + 8x^2 - 96x$ in factored form.
a. $6x(x + 4)(x - 4)$
b. $4x(x - 4)(x + 6)$
c. $4x(x + 6)(x + 4)$
d. $-4x(x + 6)(x + 4)$

____ 15. Divide $3x^3 - 3x^2 - 4x + 3$ by $x + 3$.
a. $3x^2 - 12x + 32$
b. $3x^2 - 12x + 32$, R -93
c. $3x^2 + 6x - 40$
d. $3x^2 + 6x - 40$, R 99

____ 16. Determine which binomial is *not* a factor of $4x^4 - 21x^3 - 46x^2 + 219x + 180$.
a. $x + 4$
b. $x + 3$
c. $x - 5$
d. $4x + 3$

Solve the equation by graphing.

____ 17. $-8x^3 - 13x^2 + 6x = 0$

a. no solution
b. $-2, 0.38$
c. $0, 2, -0.38$
d. $0, -2, 0.38$

Factor the expression.

____ 18. $c^3 - 512$

a. $-(c - 8)(c^2 + 8c + 64)$
b. $(c - 8)(c^2 + 8c + 64)$
c. $(c + 8)(c^2 + 8c + 64)$
d. $(c - 8)(c^2 - 8c - 64)$

____ 19. $x^4 - 20x^2 + 64$

a. $(x - 2)(x - 2)(x + 4)(x + 4)$
b. $(x - 2)(x - 4)(x^2)$
c. $(x - 2)(x + 2)(x - 4)(x + 4)$
d. no solution

____ 20. Solve $125x^3 + 343 = 0$. Find all complex roots.

a. $-\frac{7}{5}, \frac{35 \pm 35i\sqrt{3}}{50}$
b. no solution
c. $\frac{7}{5}, \frac{35 \pm 35\sqrt{3}}{50}$
d. $-\frac{7}{5}, \frac{7}{5}$

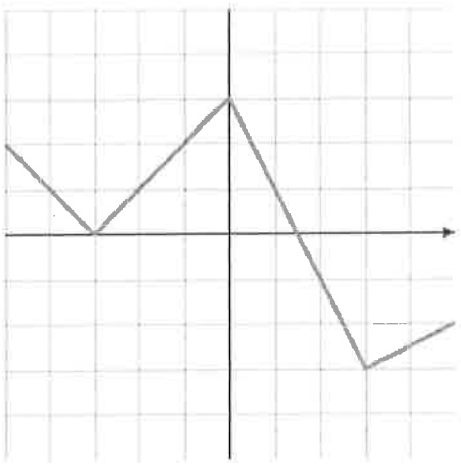
____ 21. Use the Rational Root Theorem to list all possible rational roots of the polynomial equation $x^3 + x^2 - 7x - 4 = 0$. Do not find the actual roots.

a. $-4, -2, -1, 1, 2, 4$
b. no roots
c. $1, 2, 4$
d. $-4, -1, 1, 4$

Short Answer

For questions 14-17, use the graph below. Use four different colors to sketch the transformed graphs. Hint: Use clear points from the original graph to sketch the transformed graphs.

22.



Sketch $f(x)+1$

23. Sketch $f\left(\frac{1}{2}x\right)$

24. Sketch $\frac{1}{2}f(x)$

25. Sketch $f(x+1)$

Graph the parent function AND the transformation of the graph provided.

26. $f(x) = -(x+5)^3 - 1$

27. A square and rectangle have the same area. The length of the rectangle is four inches more than twice the length of the side of the square. The width of the rectanle is 6 inches less than the side of the square. Use complete the square to fnd the length of the square.