Practice Test 2

Name_____

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Use factoring to find the zeros of the quadratic function. List the x-intercepts of the graph of the function.

1) $F(x) = x^2 - x - 56$ 1) $x = 8, -7$

$(x-8)(x+7)$ $x = 8, -7$

Find the zeros of the quadratic function using the Square Root Method. List the x-intercepts of the graph of the function.

2) $g(x) = (x-7)^2 - 49$ 2) $x = 0, 14$

$(x-7)^2 - 49 = 0$ $(x-7)^2 = 49$ $x - 7 = \pm 7$

$x = 0, 14$

Find the zeros of the quadratic function by completing the square. List the x-intercepts of the graph of the function.

3) $F(x) = x^2 + 8x + 7$ 3) $x = -7, -1$

$f(x) = x^2 + 8x + 4^2 + 7 - 4^2 \Rightarrow (x+4)^2 - 9$ $x + 4 = \pm 3$

Find the real zeros, if any, of each quadratic function using the quadratic formula. List the x-intercepts, if any, of the graph of the function.

4) $G(x) = x^2 + 5x - 14$ 4) $x = -7, 2$

$x = \dfrac{-5 \pm \sqrt{25 - 4(1)(-14)}}{2}$

Find the real zeros of the function. List the x-intercepts of the graph of the function.

5) $H(x) = x^6 + 26x^3 - 27$ 5) $x = 1, -3$

$y = x^3$ $\therefore$ $y^2 + 26y - 27 = (y+27)(y-1) = 0$ $y = -27$; $y = 1$

$x^3 = -27$ $x^3 = 1$

Find the vertex and axis of symmetry of the graph of the function.

6) $f(x) = 3x^2 - 18x$ 6) $x = 3$ axis of sym

$x = \dfrac{-b}{2a} = \dfrac{18}{6} = 3$ $(3, -27)$

Solve the problem.

7) The quadratic function $f(x) = 0.0037x^2 - 0.45x + 36.77$ models the median, or average, age, y, at which U.S. men were first married x years after 1900. In which year was this average age at a minimum? (Round to the nearest year.) What was the average age at first marriage for that year? (Round to the nearest tenth.) 7) 1961

Vertex min $x = \dfrac{-b}{2a} = \dfrac{0.45}{2(0.0037)} = 61$

$y \approx 23.1$ years old

Solve the inequality.

8) $x^2 - 3x \geq 0$ 8) $(-\infty, 0] \cup [3, \infty)$

$x(x-3) \geq 0$

Find the complex zeros of the quadratic function.

9) $F(x) = x^2 - 10x + 61$ 9) _____

$5 \pm 6i$ $\quad x = \frac{10 \pm \sqrt{100 - 244}}{2}$

State whether the function is a polynomial function or not. If it is, give its degree. If it is not, tell why not.

10) $f(x) = x(x - 9)$ yes, deg 2. 10) _____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

11) $f(x) = \frac{5 - x^5}{4} = -\frac{1}{4}x^5 + \frac{5}{4}$ 11) _____

A) No; it is a ratio
B) Yes; degree 5
C) No; x is a negative term
D) Yes; degree 1

For the polynomial, list each real zero and its multiplicity. Determine whether the graph crosses or touches the x-axis at each x -intercept.

12) $f(x) = 4(x - 7)(x - 1)^2$ 12) _____

A) -7, multiplicity 1, crosses x-axis; -1, multiplicity 2, touches x-axis
B) 7, multiplicity 1, touches x-axis; 1, multiplicity 2, crosses x-axis
C) 7, multiplicity 1, crosses x-axis; 1, multiplicity 2, touches x-axis
D) -7, multiplicity 1, touches x-axis; -1, multiplicity 2, crosses x-axis

13) $f(x) = 2(x^2 + 4)(x^2 + 1)^2$ 13) _____

A) -4, multiplicity 1, touches x-axis; -1, multiplicity 2, crosses x-axis
B) 2, multiplicity 1, crosses x-axis; -2, multiplicity 1, crosses x-axis; 1, multiplicity 2, touches x-axis; -1, multiplicity 2, touches x-axis
C) -4, multiplicity 1, crosses x-axis; -1, multiplicity 2, touches x-axis
D) No real zeros

Find the x- and y-intercepts of f.

x-int ($y=0$)
y-int ($x=0$)

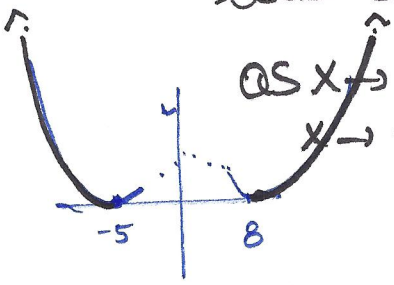
14) $f(x) = (x + 4)(x - 6)(x + 6)$ 14) C

A) x-intercepts: -4, -6, 6; y-intercept: 144
B) x-intercepts: -6, 6, 4; y-intercept: -144
C) x-intercepts: -4, -6, 6; y-intercept: -144
D) x-intercepts: -6, 6, 4; y-intercept: 144

Find the power function that the graph of f resembles for large values of $|x|$.

15) $f(x) = (x + 5)^6(x - 8)^4$ 15) _____

A) $y = x^{24}$ B) $y = x^6$ C) $y = x^4$ D) $y = x^{10}$



end behavior

as $x \to -\infty$ $y \to \infty$
$x \to \infty$ $y \to \infty$

$f(x) \sim x^{10}$