Honors Algebra 2
Chapter 6 Test REVIEW

Name: ______________________
Period: _____

NO CALCULATORS ALLOWED ON THIS SECTION!!!

Classify each polynomial by degree and by number of terms using appropriate terminology for both.

1) $2x^5 - 4x^2 + 5x - 3$ quintic polynomial

2) $-3x^2 - 8x + 4$ quad trinomial

3) $-5x^3 - 2x^2 - x$ cubic trinomial

Describe the end behavior of each function.

4) $x^4 + 3x^2 - 5$ ↑ ↑

Left: as $x \to -\infty$, $f(x) \to +\infty$

Right: as $x \to \infty$, $f(x) \to +\infty$

5) $-5x^3 - 2x^2 + x$

Left: as $x \to -\infty$, $f(x) \to +\infty$

Right: as $x \to +\infty$, $f(x) \to -\infty$

6) $-2x^2 - 8x^3 + 24$

Left: as $x \to -\infty$, $f(x) \to +\infty$

Right: as $x \to +\infty$, $f(x) \to -\infty$

Find all solutions/zeros/roots of the polynomial Furnish all info requested.

7) $x^3 - 2x^2 - 13x - 10 = 0$

a) List all possible rational 0's: $\pm 1, \pm 10, \pm 2, \pm 5$

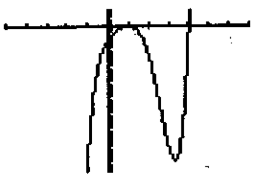
b) Create a Descarte's Chart:

TOT	POS	NEG	i
3	1	2	0
3	1	0	2

c) Solutions: $-2, -1, 5$

8) Discuss **ALL** facts *known definitively* about this function's roots given ONLY the function and the graph. You do NOT need to solve the function to write your essay.

$P(x) = x^5 - 6x^4 + 13x^3 - 28x^2 + 36x - 16$



① Tot roots = 5
② Poss rat'l roots: ±1, ±16, ±8, ±2, ±4
③ Root @ 4 w/ mult of 3 or 1
④ Root @ 1 w/ mult of 2 or 4
⑤ Complex roots → 2 or 0

T	P	N	i	
5	5	0	0	
5	3	0	2	NOT POSS BASED ON GRAPH
5	1	0	4	NOT POSS BASED ON GRAPH

Simplify.

9) $\left(\dfrac{2x^{-2}y^5}{3x^3y^{-3}}\right)^{-2} = \left(\dfrac{2y^8}{3x^5}\right)^{-2} = \left(\dfrac{2^{-2}y^{-16}}{3^{-2}x^{-10}}\right) = \boxed{\dfrac{9x^{10}}{4y^{16}}}$

10) $\dfrac{12x^4y^5 + 8x^3y^7 - 16x^2y^6}{4xy^5} = \dfrac{12x^4y^5}{4xy^5} + \dfrac{8x^3y^7}{4xy^5} - \dfrac{16x^2y^6}{4xy^5} = \boxed{3x^3 + 2x^2y^2 - 4xy}$

11) $(a^4 + 5a^3 + 2a^2 - 6a + 4)(a + 2)^{-1}$

-2	1	5	2	-6	4
		-2	-6	8	-4
	1	3	-4	2	0

$\boxed{a^3 + 3a^2 - 4a + 2}$

12) Explain how to find P(5) for $P(x) = x^2 + 4x + 1$ using the Remainder Theorem. Be sure to show your result. The remainder when dividing P(x) by (x−5) = P(5).

5	1	4	1
		5	45
	1	9	46

$5^2 + 4(5) + 1$

$25 + 20 + 1 = 46$

$P(5) = 46$

The remainder, 46, is equal to the value of P(5) confirmed by direct substitution.

Write each sum or difference of polynomials in standard form.

13) $(2x^2 + 3x^4 - 6) - (5x^4 + 2x^2 - 4)$

$-2x^4 - 2$

14) $(3x^3 - 2x + 14) + (8x^3 + 12x^2 - 5x + 11)$

$11x^3 + 12x^2 - 7x + 25$

15) Multiply & write answer in standard form: $(x - 3)^2(x + 2)$

$x^3 - 4x^2 - 3x + 18$

16) Use polynomial long division to find the quotient of $(x^3 + 3x + 4) \div (x + 1)$

$x^2 - x + 4$

$x + 1 \overline{)\, x^3 + 0x^2 + 3x + 4}$

$x^3 + x^2$

$-x^2 + 3x$

$-x^2 - x$

$4x + 4$

$4x + 4$

17) Factor $27x^3 + 64$

$(3x+4)(9x^2 - 12x + 16)$

$a = 3x$

$b = 4$

18) Use synthetic division to find the quotient: $(x^3 - 5x^2 - 2x + 24) \div (x - 3)$

$x^2 - 2x - 8$

3	1	-5	-2	24
		3	-6	-24
	1	-2	-8	0

19) Use "U" substitution to find all of the real roots of: $x^4 + 33 = 14x^2$

$\pm\sqrt{11}, \pm\sqrt{3}$

20) Graph. Find any local max/min. to nearest tenth: $x^3 - 4x^2 + 1$

Max: $(0, 1)$ Min: $(2.7, -8.5)$

21) Given 7 is a root, find all of the other roots of $x^3 - 7x^2 + 9x - 63 = 0$.

$\pm 3i$

22) Write the polynomial function P(x) in standard form for P which is of degree 3; P(0) = -36; zeros are 3 & 2i. $3x^3 - 9x^2 + 12x - 36$

23) If a polynomial has an ODD number of repeated Factors, what do you know about its graph?

The graph will cut through the x-axis at that root. For example if $P(x) = (x-3)^5$, the root 3 occurs 5 times so the graph will cut through the x-axis at x=3.

** Review Vocabulary info on page 397.**

** TRY a Practice Test on-line or in your text (page 401).

25) Explain what the # of U-turns in the graph of a polynomial tells us about the degree of the function.

Since the maximum number of U-turns is one less than the degree of the polynomial, the minimum degree of the polynomial can be found by adding one to the number of U-turns.