Pre-Calculus Practice Test 2.4-2.5 Assg.#_____

Name:_____Date:_____ Per:_____

NO GRAPHING CALCULATORS ALLOWED. SHOW ALL THE WORK.

I. Use long division to find the quotient of:

1) $(x^3 - 2x^2 - 5x + 6) \div (x - 3)$
2) $(x^4 - 81) \div (x + 5)$
3) $(18x^4 + 9x^3 + 3x^2) \div (3x^2 + 1)$

II. Use synthetic division to find the quotient of:

4) $(3x^2 + 7x - 20) \div (x + 5)$
5) $(6x^5 - 2x^3 + 4x^2 - 3x + 1) \div (x - 2)$
6) $(x^7 + x^5 - 10x^3 + 12) \div (x + 2)$

III. Use the **Remainder Theorem** to find the remainder:

7) $(x^3 - 7x^2 + 5x - 6) \div (x - 3)$
8) $(x^4 - 5x^3 + 5x^2 + 5x - 6) \div (x + 2)$

IV. Use the **Remainder Theorem & Factor Theorem** to determine:

9) If $(x - 3)$ is a factor of $3x^3 - 2x^2 - 5x + 1$
10) If $(x + 2)$ is a factor of $5x^3 + 10x^2 - 5x + 10$

V. Solve the polynomial functions:

11) $f(x) = 2x^3 - 5x^2 + x + 2$
12) $f(x) = 12x^3 + 16x^2 - 5x - 3$
13) $f(x) = x^4 - 6x^2 - 8x + 24$
14) $f(x) = x^4 - 2x^3 + x^2 + 12x + 8$

15) Fill in the table with all the possible combinations for the zeros for the following polynomial function:

$$f(x) = 2x^5 - 3x^3 - 5x^2 + 3x - 1$$

Possible Positive Real Zeros	Possible Negative Real Zeros	Possible Imaginary Zeros

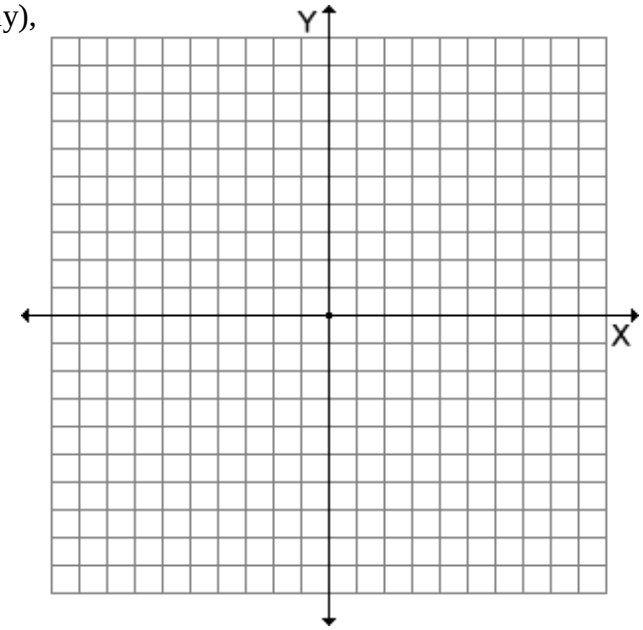
16) Solve the following polynomial function, given that 2 is a zero:
$f(x) = 2x^3 + x^2 - 13x + 6$

1)
2)
3)
4)
5)
6)
7)
8)
9)
10)
11)
12)
13)
14)
16)
17) a) b)
c) d)
e) f)
g) h)
18)
19)

17) $f(x) = 2x^3 + x^2 - 13x + 6$

a) According to the Fundamental Theorem of Algebra, determine the number of complex zeros.
b) At most how many turns in the graph?
c) According to Descartes' Rule of Signs, determine the number of possible positive real zeros.
d) According to Descartes' Rule of Signs, determine the number of possible negative real zeros.
e) According to the Rational Zero Theorem, list all the possible rational zeros.
f) Factor completely.
g) Determine all the zeros.
h) Determine the y-intercept.
i) Sketch the graph. Graph all the zeros, y-intercept (if any), and critical points (approximate as needed).

x-axes by 1 y- axes by 2



18) Find a 3rd degree polynomial function f(x) with real coefficients that has 2, and 2-3i as zeros, such that f(1) = –10. Write the answer as a function in descending order.

19) Find a 4th degree polynomial function f(x) with real coefficients, i is a zero and -3 is a zero of multiplicity 2, such that f(-1) = 16. Write the answer as a function in descending order.