

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

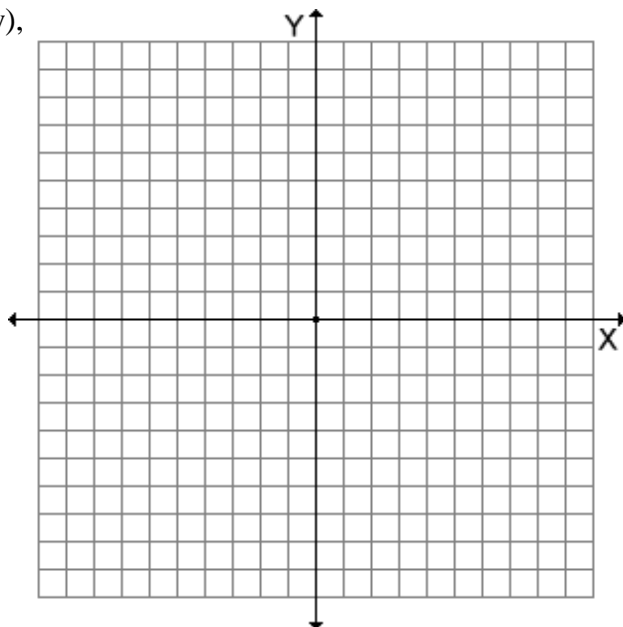
16) Solve the following polynomial function, given that 2 is a zero:
 $f(x) = 2x^3 + x^2 - 13x + 6$

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.