MHF 4UI - EXAM REVIEW

Chapter 1 - Polynomials

DIVIDING POLYNOMIALS

Example: Divide $(x^3 + 3x^2 - 5x - 4) \div (x + 4)$

Long Division:

Synthetic Division:

Factor Theorem/Remainder Theorem:

Remainder Theorem: When a polynomial P(x) is divided by (x - b), the remainder is P(b).

Factor Theorem: A Polynomial P(x) has a factor (ax - b) iff P(b/a) = 0

Example: Find the remainder when $x^2 - 5x - 3$ is divided by (x - 2).

Example: Factor the following completely: $x^3 + 8x^2 + 19x + 12$

SUM and DIFFERENCE of CUBES

$a^3 - b^3 =$ $(a - b)(a^2 + ab + b^2)$

$a^3 + b^3 =$ $(a + b)(a^2 - ab + b^2)$

SOLVING POLYNOMIAL EQUATIONS

Example: Solve $3x^3 - 10x^2 = -3x$

SOLVING POLYNOMIAL INEQUALITIES

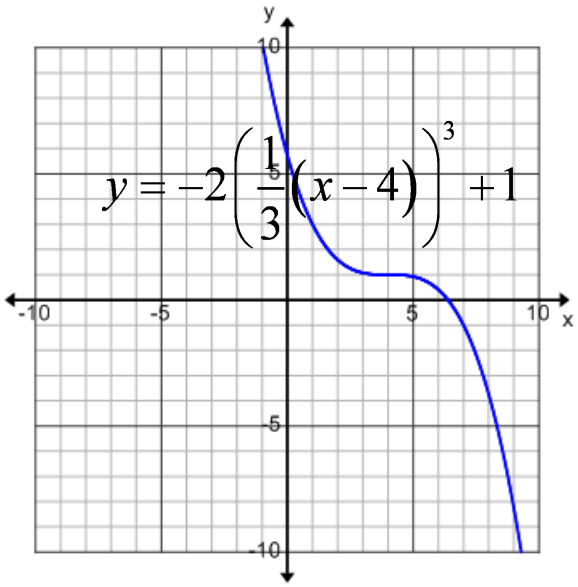
Example: Solve $x^2 + 8x - 9 \leq 0$

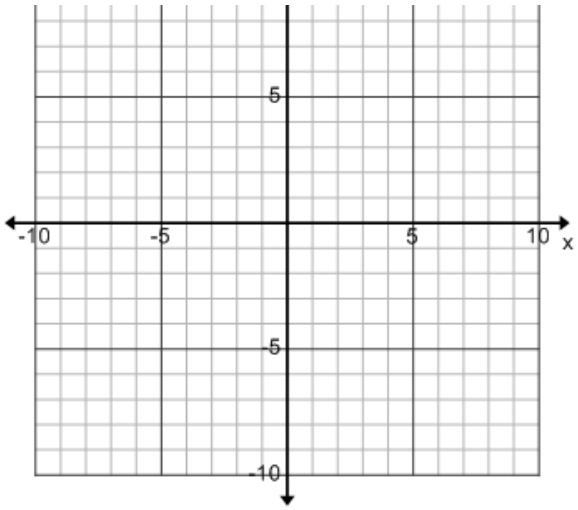
FIRST solve: $x^2 + 8x - 9 = 0$

THEN: Make an Interval Chart:

GRAPHING CUBIC AND QUARTIC FUNCTIONS (and TRANSFORMATIONS)

Example: Explain the transformations applied to the basic graph :ant). Then Graph the





Finite Differences

- Linear - differences are m (slope of the line) $y = mx + b$
- Quadratic - differences are 2a $y = ax^2 + bx + c$
- Cubic - differences are 6a $y = ax^3 + bx^2 + cx + d$

Example: Given the following table, determine the equation that models the data:

X	Y	Differences	
		First	Second
-2	16		
-1	6		
0	2		
1	4		
2	12		