UNIT 1 REVIEW: OPERATIONS OF POLYNOMIALS

1) Find the difference of $(x^3 + 5x - 4)$ and $(x^2 - 8x + 3)$.

2) Express $(3x - 2)(x^2 - 4x + 1)$ as a polynomial in simplest form.

3) Multiply $(-2 x + 5)$ by its conjugate.

4) Simplfy: $(x - 6)^3$

5) Find the quotient using long division: $\dfrac{2x^3 + 9x^2 + 8x + 2}{2x+1}$

Factor COMPLETELY:

6) $x^4 + 13x^2 + 12$	7) $9c^2 - 16$
8) $3x^2 - 6x - 9$	9) $2x^2 - 5x - 12$

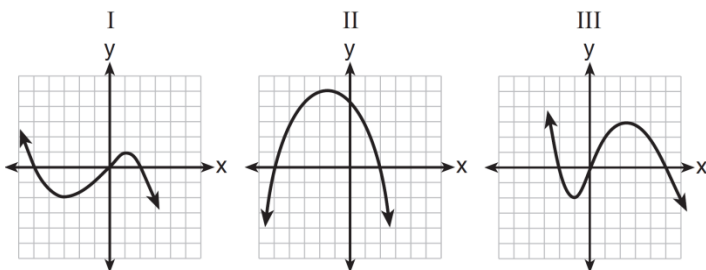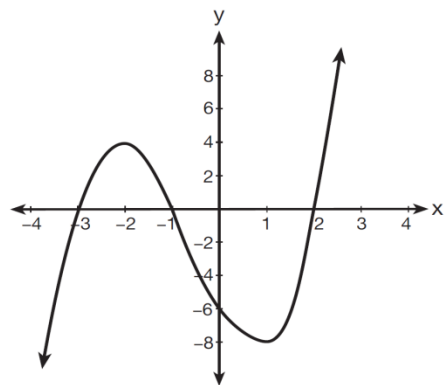|	
10) $3x^2 - 27$	11) $x^3 + 3x^2 - 4x - 12$
12) $125x^3 - 27$	13) $1 + 64a^3$
14) $x^2 - 20xy - 156y^2$	15) $x^4 - 16$

16) A polynomial function contains the factors x, $x - 2$, and $x + 5$. Which graph(s) below could represent the graph of this function?

1) I, only

2) II, only

3) I and III

4) I, II, and III

17) Given the graph below:

a) State the zeros (roots) of the function: _____

b) State the factors of the function:_____

c) State the equation of the function: _____

18) Suppose one of the factors of $x^3 - 10x^2 + 27x - 18$ is $(x-3)$, what are the other two *factors*?

19) Suppose we know that the polynomial equation has three real solutions and that one of the roots of $x^3 + 3x^2 - 4x - 12 = 0$ is x = -3. State all *solutions*.

20) Factor $x^3 - 64$

    (1) $(x + 4)(x^2 - 4x +16)$ (3) $(x - 4)(x^2 + 4x +16)$

    (2) $(x + 8)(x^2 - 8x +64)$ (4) $(x - 8)(x^2 + 8x +64)$

21) Which polynomial represents $(x^2 + 2x - 1)(4x - 5)$? (Use your calculator to do this problem)

    (1) $4x^3 - 5x^2 - 6x + 5$

    (2) $4x^3 + 3x^2 - 14x - 5$

    (3) $4x^3 + 3x^2 - 14x + 5$

    (4) $4x^3 - 3x^2 - 14x + 5$

22) The completely factored form of $2d^4 + 6d^3 - 18d^2 - 54d$ is

    (1) $2d(d^2 - 9)(d + 3)$ (3) $2d(d + 3)^2(d - 3)$

    (2) $2d(d^2 + 9)(d + 3)$ (4) $2d(d - 3)^2(d + 3)$

21) Which factorization is *incorrect*?

    (1) $4k^2 - 49 = (2k + 7)(2k - 7)$

    (2) $a^3 - 8b^3 = (a - 2b)(a^2 + 2ab + 4b^2)$

    (3) $m^3 + 3m^2 - 4m + 12 = (m - 2)^2(m + 3)$

    (4) $t^3 + 5t^2 + 6t + t^2 + 5t + 6 = (t + 1)(t + 2)(t + 3)$