Name:_____ Date:_____

Math12 Honors: HW 3.3 Solving Problems and Equations with Polynomial Functions

1. Find the equation of the polynomial with the given information. Then find the relative max/min:

a) zeroes: -1, 2, 2 & Y-intercept: (0.-4)	b) Roots: -3, 2, 5, $f(3)=3$
c) X-int: -3, 3, 8 Y-int: (0,10)	d) Dbl Rt: 4, Triple Rt: 2 $P(1)=5$
e) Zeroes: 0, 0, 1, 1, 1, 2 & $f(-1)=12$	f) $P(1)=4,\ P(-2)=-11,\ P(3)=34$ Degree of 3.

2. If the binomial $x-r$ is a factor of the polynomial $P(x)$, that what is the value of $P(r)$?

3. Find all the values of "*m*" which will make $x+2$ a factor of $x^3+3m^2x^2+mx+4$

4. If $x-k$ is a factor of $2x^3-kx^2+(1-k^2)x+5$. What is the value of "k"?

5. Solve for the roots of the following polynomial functions:

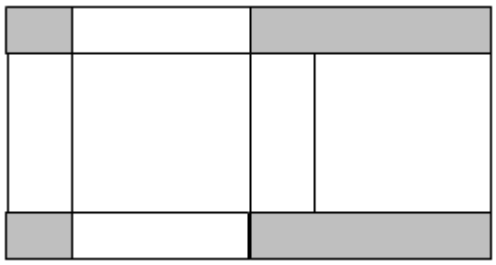
a) $x^3+3x^2-16x-48=0$	b) $6x^3-13x^2+4=0$
c) $3x^4-5x^2+x+5=0$	d) $2x^3-x^2+3x-6=0$
e) $x^3+x^2-8x-12=0$	f) $6x^3+11x^2-4x-4=0$
g) $x^3+3x^2+3x+1=343$	h) $x^5-5x^4+10x^3-10x^2+5x-2=31$

6. Find the relative max and min for each of the following cubic functions

a) $f(x)=2x^3-3x^2-8x+12$	b) $f(x)=20x^3+17x^2-40x+12$
c) $f(x)=2x^3+x^2-25x+12$	d) $f(x)=x^3+9x^2+26x+24$

7. A piece of card board is 40meters by 50meters. Four squares are cut out from the corners to create a box. What is the largest possible volume of a box that can be created from the piece of cardboard? The top side is not needed.

8. If the same piece of cardboard is cut like the diagram below to make an addition top side, what is the largest volume possible?



9. Given that $x^2-4,\ x^2-2x,\ and\ x^2+x-2$ are all factors of the polynomial $y=f(x)$. What is the lowest possible degree of the polynomial? What is the equation?

10. The polynomial $f(x)$ satisfies the equation $f(x)-f(x-2)=(2x-1)^2$ for all "x". If "p" and "q" are the coefficients of x^2 and x, respectively, in $f(x)$, then what is the value of $p+q$?

11. Find the range of the function: $h(y)=2y^4-9y^3+14y^2+6y-63$

12. Given the equation $(x+1)(x+2)(x+3)(x+4)=k$, for what values of "K' will there be four solutions?

13. Challenge: Find (with proof) the product of all the real solutions of the equation:
$x^{101}-4x^{99}+x^{98}-4x^{96}-x^{95}-4x^{93}+....+x^5-4x^3+x^2-4=0$

14. Challenge: Let "a", "b", and "c" be the roots of the cubic equation $x^3+3x^2-1=0$. Write down a cubic polynomial whose roots are a^2, b^2, and c^2. Finding "a", "b", and "c" may be difficult. Can we solve the problem without doing that? PIMS UBC