Assignment #23 Advanced Algebra Unit 5 Polynomials Review problems for Unit Test.

1) Factor the following: $\frac{x+3}{x^2-x-12}$

$\frac{(x+3)}{(x-4)(x+3)} \quad \frac{1}{(x-4)}$

#1 Final answer

$\frac{1}{(x-4)}$

2) Expand the following: $(2x-4)^2$

$4x^2-16x+16$

#2 Final Answer

$4x^2-16x+16$

3) Simplify 8x+5-(7x+10)

$8x+5-7x-10$

#3 Final Answer

$x-5$

4) $\frac{x^2+8x+12}{3x+24} \div \frac{x^2-8x-20}{x^2+10x+16}$

Remember: You MUST Factor!

Reciprocal the second, Multiply

$\frac{(x+6)(x+2)}{3(x+8)} \cdot \frac{(x+8)(x+2)}{(x-10)(x+2)}$

#4 Final Answer

$\frac{(x+6)(x+2)}{3(x-10)}$

5) Use the power rule to identify the Local Max and Local Min of the following polynomial: $x^3-28x-48$

$3x^2-28=0$

$x=\pm\sqrt{\frac{28}{3}}$

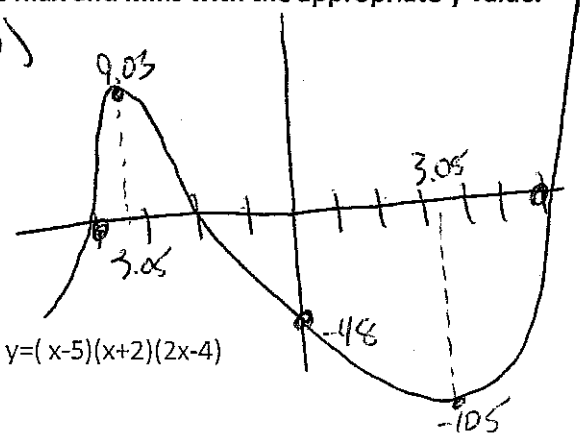
± 3.05

Sketch of the graph label the max and mins with the appropriate y value.

Roots (-4,0) (6,0)

VARS(-3.05) = 9.03

VARS(3.05) = -105



6) Multiply the following out y=(x-5)(x+2)(2x-4)

	$x^2-3x-10$
$2x$	$2x^3-6x^2-20x$
-4	$-4x^2+12x+40$

#6 Final Answer

$2x^3-10x^2-8x+40$

7) Expand $(2x-5)^3$

$8x^3-3(2x)^2(5)+3(2x)25-125$

#7 Final Answer

$8x^3-60x^2+150x-125$

8) Use the difference of two cubes to Factor $8x^3-64$

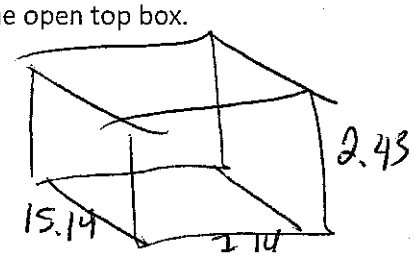
$2x \quad 4$

Sum of two Cubes: $a^3+b^3=(a+b)(a^2-ab+b^2)$	$X^3+8=(x+2)(x^2-2x+4)$
Difference of two Cubes: $a^3-b^3=(a-b)(a^2+ab+b^2)$	$8x^3-1=(2x-1)(4x^2+2x+1)$

#8 Final Answer

$(2x-4)(4x^2+8x+16)$

9) Write the Equation and show how to find the max volume for a piece of paper 12 by 20. You will be making the open top box.



$y=x(12-2x)(20-2x)$

$y=4x^3-64x^2+240x$

$12x^2-128x+240$

2.43

8.24

10) Use long division to factor the polynomial f(x)= ~~x3+0x2-84x-160~~ given a root is at -8

Make sure you are using (x+8 when you set up your division!

$$y = (x+8)(x-10)(x+2)$$

$$x+8 \overline{)\, x^3 + 0x^2 - 84x - 160}$$

$x^2 - 8x - 20$

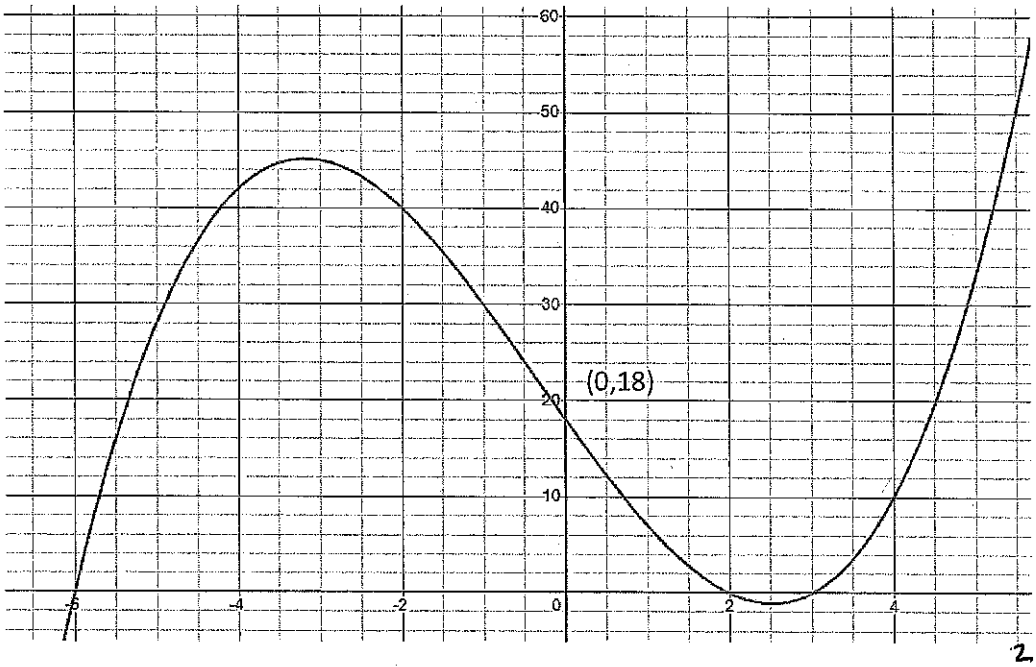
$-x^3 + 8x^2$

$-8x^2 - 84x$

$+8x^2 + 64x$

$-20x - 160$

11) Write the equation of the graph that is shown.



$y = a(x+6)(x-2)(x-3)$

$\frac{18}{36} = \frac{36a}{36}$ $\quad a = \frac{1}{2}$

$x^2 + 4x - 12$

$x - 3 \;|\; x^3 + 4x^2 - 12x + 36$

$-3x^2 - 12x$

Factored form

$$y = \frac{1}{2}(x+6)(x-2)(x-3)$$

General form

$$\frac{1}{2}x^3 + \frac{1}{2}x^2 - 12x + 18$$

$x^3 + 1x^2 - 24x + 36$