College Algebra **Name:** Key

Unit 2 LT 4 Practice Day 1 **Date:** _____ **Period:** _____

Use synthetic division to find all zeros of the polynomial function. Then, rewrite the function in factored form.

1.) $f(x) = x^3 - 7x + 6; (x = -3)$

$-3 \mid 1 \quad 0 \quad -7 \quad 6$
$\quad\quad\quad -3 \quad 9 \quad -6$
$\quad\quad 1 \quad -3 \quad 2 \quad \boxed{0}$

$x^2 - 3x + 2$

$(x-2)(x-1)$

Factored Form: $(x+3)(x-2)(x-1)$

Zero(s): $x = -3, 2, 1$

2.) $f(x) = 5x^2 - 17x - 12; \ (x-4)$ $(5x+3)$

$4 \mid 5 \quad -17 \quad -12$
$\quad\quad\quad 20 \quad 12$
$\quad 5 \quad 3 \quad \boxed{0}$

$5x + 3 = 0$

Factored Form: $(x-4)$

Zero(s): $x = 4, -3/5$

3.) $f(x) = x^3 + 4x^2 - 4x - 16$

$2 \mid 1 \quad 4 \quad -4 \quad -16$
$\quad\quad\quad 2 \quad 12 \quad 16$
$\quad 1 \quad 6 \quad 8 \quad 0$

$x^2 + 6x + 8$

$(x+4)(x+2)$

Factored Form: $(x-2)(x+4)(x+2)$

Zero(s): $x = 2, -4, -2$

4.) The volume of a rectangular prism is $4x^3+16x^2-23x-15$. Find the length and width if the height is $(x+5)$. Write your answer in factored form.

( )( )$(x+5) = 4x^3+16x^2-23x-15$

$x+5$

$-5 \mid 4 \quad 16 \quad -23 \quad -15$

$\quad\quad -20 \quad 20 \quad 15$

$\quad 4 \quad -4 \quad -3 \quad 0$

12, 6, −2, 4

$4x^2-4x-3=0$

$4x^2+6x-2x-3$

$2x(2x+3) \quad -1(2x+3)$

$(2x+3)(2x-1)$ ← length + width

5.) The area of a rectangle is $2x^4-8x^3+13x^2-28x+21$. Find the length if the width is $(x-1)$. Write your answer in factored form.

$1 \mid 2 \quad -8 \quad 13 \quad -28 \quad 21$

$\quad\quad 2 \quad -6 \quad +7 \quad -21$

$\quad 2 \quad -6 \quad 7 \quad -21 \quad 0$

$2x^3-6x^2+7x-21$ ⇐ length

$2x^2(x-3) \quad 7(x-3)$

$(2x^2+7)(x-3)$ ← factored form

6.) Find the key information and graph the following function.

$f(x)=x^3-5x^2+2x+8$

Degree 3

Zero(s): $x=-1 \quad x=2 \quad x=4$

Relative Max: $(.2, 8.2)$

Relative Min: $(3.1, -4.1)$

End Behavior: $x \to \infty \quad f(x) \to \infty$

$x \to -\infty \quad f(x) \to -\infty$

Domain: $(-\infty, \infty)$

Range: $(-\infty, \infty)$