

Advanced Algebra

Unit 5 Polynomial functions. Using the power rule to find the max and min of the given functions.

Unit 5: Assignment #4

Either use long division or your calculator to find the other roots.

1) $y = x^3 - 2x^2 - 40x - 64$ GIVEN roots is -4

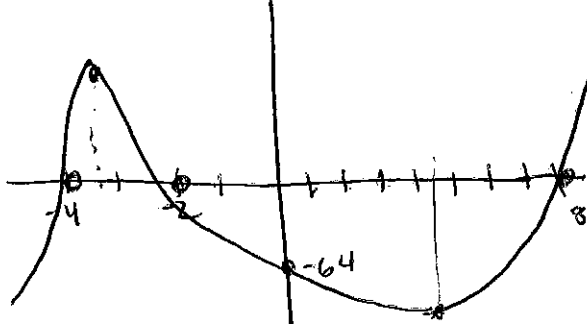
Derivative Function and Solutions

$$3x^2 - 4x - 40$$

$$(4.37, -193.5) \text{ Min}$$

$$(-3.04, 11.02) \text{ MAX}$$

Accurate Sketch labeled with the Max and Min



2) $y = x^3 - 4x^2 - 20x + 48$ GIVEN ROOT is 6

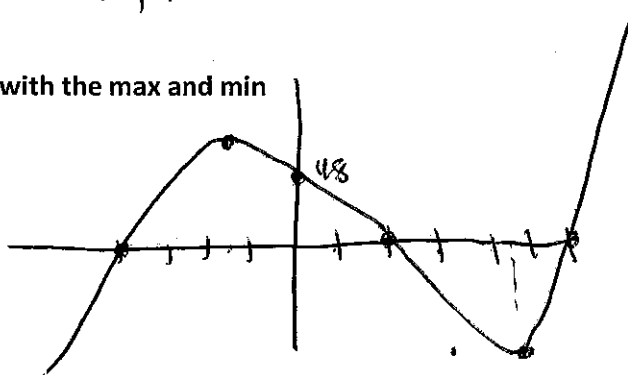
Derivative Function and solutions

$$3x^2 - 8x - 20$$

$$(4.23, -32.5) \text{ Min}$$

$$(-1.57, 81.81) \text{ MAX}$$

Accurate Sketch labeled with the max and min



Factored Equation:

$$y = (x+4)(x-8)(x+2)$$

Roots:

$$-4 \quad 8 \quad -2$$

$$\begin{array}{r} x^2 - 6x - 16 \\ x+4 \overline{) x^3 - 2x^2 - 40x - 64} \\ \underline{x^3 + 4x^2} \\ -6x^2 - 40x \\ \underline{-6x^2 + 24x} \\ -16x - 64 \end{array}$$

Factored Equation

$$y = (x-6)(x+4)(x-2)$$

Roots:

$$6 \quad -4 \quad 2$$

3) $y = x^3 + 6x^2 - 1x - 30$ GIVEN ROOT is 2

$3x^2 + 12x - 1$

(.08, -30.04) Min

(-4.08, 6.04) Max

$y = (x-2)(x+5)(x+3)$

Roots 2, -5, -3

$$\begin{array}{r} x^2 + 8x + 15 \\ x-2 \overline{) x^3 + 6x^2 - 1x - 30} \\ \underline{-x^3 + 2x^2} \\ 8x^2 - 1x \\ \underline{-8x^2 + 16x} \\ 15x - 30 \end{array}$$

4) $y = x^3 + 4x^2 - 76x - 160$ Given ROOT is -2

$3x^2 + 8x - 76$

(3.87, -336.3) Min

(-6.54, 228) Max

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

-2 -10 8

$$\begin{array}{r} x^2 + 2x - 80 \\ x+2 \overline{) x^3 + 4x^2 - 76x - 160} \\ \underline{x^3 + 2x^2} \\ 2x^2 - 76x \\ \underline{-2x^2 + 4x} \\ -80x - 160 \end{array}$$

5) $y = x^3 - 14x^2 + 8x + 320$ Given root is 4

$3x^2 - 28x + 8$

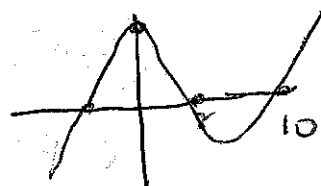
9.03 2.9

(0.29, 321) Max

(9.03, -13) Min

$$\begin{array}{r} x^2 - 18x + 80 \\ x+4 \overline{) x^3 - 14x^2 + 8x + 320} \\ \underline{x^3 + 4x^2} \\ -18x^2 + 8x \\ \underline{+18x^2 + 72x} \\ 80x + 320 \end{array}$$

$y = (x+4)(x-10)(x-8)$



6) $y = x^3 + 1x^2 - 30x - 72$ Given root is 6

$3x^2 + 2x - 30$

2.85 -3.5

(-3.5, 2.375) Max

(2.85, -126) Min

$$\begin{array}{r} x^2 + 7x + 12 \\ x-6 \overline{) x^3 + 1x^2 - 30x - 72} \\ \underline{x^3 + 6x^2} \\ 7x^2 - 30x \\ \underline{-7x^2 + 42x} \\ 12x - 72 \end{array}$$

$y = (x-6)(x+4)(x+3)$

