Unit 2 Polynomial Graphs Corrective Assignment

Period_____

Name_____

Use the Remainder Theorem to find the remainder for each of the following divisions:

1. $\frac{x^3-x^2-x-1}{x-2}$

2. $\frac{-x^3-x^2+3}{x+3}$

3. Is $(x-4)$ a factor of $2x^4-9x^3-20x^2+147x-180$? Find out by using the Factor theorem.

4. Write a polynomial function in standard form that has the following zeros at x = 2, x = -½ and x = -1.

5. Find the value of ***p*** such that $\frac{px^2-4px-8}{x-5}$ has a remainder of -3.

Sketch the following functions without a graphing utility.

6. $F(x) = -2(x-1)(2x+1)(x+5)$

Degree:

End Behavior:

Zeros/Multiplicity:

Sketch:

7. $D(x) = 2(x+3)(x-3)(x-6)^2$

Degree:

End Behavior:

Zeros/Multiplicity:

Sketch:

Use your calculator to find the zeros, find the extrema and tell the end behavior. If necessary, round to the nearest hundredth.

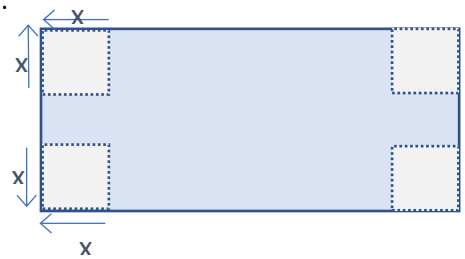
8. $F(x) = 3x^3 - 4.1x^2 - x + 1$

Zeros:

End Behavior:

Extrema:

9. Suppose we have a piece of cardboard that is 35 cm by 20 cm. We want to construct an open topped box by cutting out congruent squares from each corner.



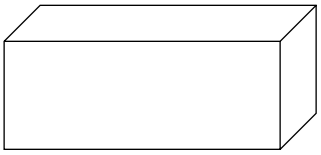
a. Express the dimensions of the box in terms of x:

b. Write a formula for the volume of the box as a function of x in standard form.

c. Find the value of x that would maximize the volume of the box.

d. What is the largest volume possible?

10. Suppose you know that the volume of the following prism is represented by $V(x) = -2x^3 + 14x^2 + 120x$.



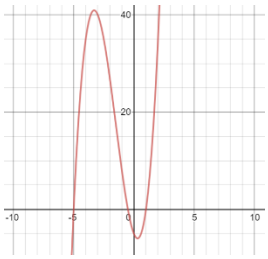
(x – 12)

a. If one known side is (x - 12) feet, find the other two dimensions.

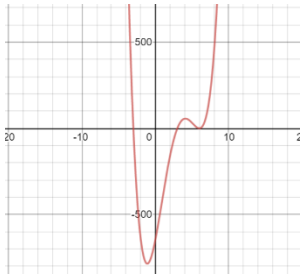
b. Use your graphing calculator to find the approximate value of x that maximizes the volume of the prism. Is this value reasonable?

Unit 2 Polynomial Graphs Corrective Assignment Answers

1) 1
2) 21
3) No
4) $P(x) = 2x^3 - x^2 - 5x - 2$
5) Sub in 5 for x : 25p – 20p – 8 = -3
   p = 1
6) Zeros: x = 1, x = $-\frac{1}{2}$, x = -5 (Crosses at all three)
   End Behavior: $x \to -\infty, F(x) \to -\infty$
   $x \to \infty, F(x) \to \infty$



7) Zeros: x = ± 3 (crosses); x = 6 (Tangent)
   End Behavior: $x \to -\infty, F(x) \to \infty$
   $x \to \infty, F(x) \to \infty$



8) Zeros: x ≈ -0.52, x ≈ 1.44; x ≈ -0.45
   Local (rel) Max: (-0.11, 1.1)
   Local (rel) Min: (1.0, -1.1)

9) a. $V(x) = x(35 - 2x)(20 - 2x)$
   b. $V(x) = 4x^3 - 110x^2 + 700x$
   c. x = 4.098
   d. $V(x) 1296.584\ cm^3$

10) a. -2x and (x – 5) (factor into -2x(x-5)(x+12))
    b. The relative maximum occurs when x = 2.71, however one side length is (x-5) so this would produce a negative side length. This is not reasonable for this problem.