Math-8 Exam Chapter 3

Name: _____

This is a take-home exam. You may use your books, notes, and calculator; however, you are not allowed to work together or get outside help. Show all work; there is no credit for guessed answers. All values should be exact (no decimals) unless you are specifically asked for an approximate value answer. All domains and ranges should be expressed in interval notation.

Do the exam on the front side only of 8×11 college rule or graph paper. Staple all pages and make sure that your name is on the first page. Treat this like you would a term paper!

Your final version is due within the first 15 minutes of class on Monday, December 5. Late papers or papers that do not meet the submission guidelines will not be accepted.

1). Consider the following quadratic function:

$$f(x) = -10x^2 + 100x - 150$$

   a). Put this equation in standard form by completing the square. There is no credit for any other method.

   b). What are the coordinates of the vertex?

   c). What is the maximum value of the function?

   d). At what value of x does the maximum value occur?

   e). What are the x intercepts (if any)?

   f). What are the y intercepts (if any)?

   g). What is the domain?

   h). What is the range?

   i). What is the axis of symmetry?

   j). Sketch the graph. Be sure to label all key points and indicate the axis of symmetry.

2). Consider the following polynomial function:

$$f(x) = -x^6 + x^5 + 8x^4 - 12x^3$$

a). Completely factor the polynomial function. For full credit, you must show how you determined your candidates, how you verified that a candidate was indeed a zero, and the resulting long divisions. The final factorization must be clearly stated.

b). Sketch the polynomial. For full credit you must label all intercepts, indicate why you do or do not change sign at a zero (sign table or multiplicity), and show the proper shape at each zero. Simply plotting points or copying directly from your calculator receives zero credit.

c). Determine (using your calculator) all minima.

d). Determine (using you calculator) all maxima.