MA 180   Professor Fred Katiraie   Pre Calculus Practice Test II

Name: _____   **Date:** _____

1) Graph the following function $f(x) = -4x^2 - 6x + 2$ and determine the following

(16 points)

   a) Graph

   b) Vertex

   c) Axis of symmetry

   d) Y intercept(s)

   e) X intercept

2) A developer wants to enclose a rectangular grassy lot that borders a city street for parking. If the developer has 380 feet of fencing and does not fence the side along the street, what is the largest area that can be enclosed?   (12 points)

3) For the following function $f(x) = (x-2)^2 (x+2)(x+4)$ Determine the following

    a) Find the x intercept

    b) Find the y intercept

    c) Determine whether the graph crosses or touches the x axis at each x intercept.

    d) End behavior: Find the power function that the graph of f(x) resembles for large values of |x|

    e) Determine the number of turning points on the graph of f(x)

4) For the rational function $R(x) = \dfrac{x^3 - 1}{x^2 + 2x}$ (12 points)

a) Find the domain of the rational function

b) Write R(x) in the lowest terms

c) Locate the x-intercept, and y-intercept

d) Test for symmetry

e) Locate the vertical asymptote

f) Locate the horizontal or oblique asymptote if any

g) Graph the function using results from steps a to f

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5) Solve the following inequality algebraically $6x - 5 < \dfrac{6}{x}$ (14 points)

6) Find the real zeros of $f(x) = x^3 + 2x^2 - 5x - 6$ □□□use the following steps please)□ $\big(10$

points)

Step 1) Use the degree of the polynomial to determine the maximum number of zeros

Step 2) Use the Rational Zeros Theorem to identify those rational numbers that potentially can be zeros

Step 3) Using your calculator, graph the polynomial function

Step 4) Identify the real zeros of $f(x) = x^3 + 2x^2 - 5x - 6$

Step 5) Now, use the real zeros to factor the function □□ $f(x) = x^3 + 2x^2 - 5x - 6$ □

7) Form a polynomial f(x) with real coefficients having
   a degree of 4 and the following zeros 3 (multiplicity 2);   and -i   (10 points)

8) Find the complex zeros of the following polynomial function
   $$f(x) = x^3 + 13x^2 + 57x + 85$$
(20 points)

Step 1) Use the degree of the polynomial to determine the maximum number of zeros

Step 2) Use the Rational Zeros Theorem to identify those rational numbers that potentially can be zeros.

Step 3) Now use long division to find the other factors.

9) Factor Completely   (10 points)

a) $\qquad x^3 + 2x^2 - x - 2$

b) $\qquad x^4 - 1$

10) Perform the following   (10 Points)

$4x^3 - 3x^2 + x + 1$ divided by $4x^2 + 1$

11) Suppose that the manufacturer of gas clothes dryer has found that, when the unit price is p dollars, the revenue R (in dollars) is $R(p) = -4p^2 + 4000p$

a) What unit price should be established for each dryer to maximize the revenue?

b) What is the maximum revenue?