

Name: _____

Panther ID: _____

Spring 2014

MAC 1140 - Precalculus Algebra

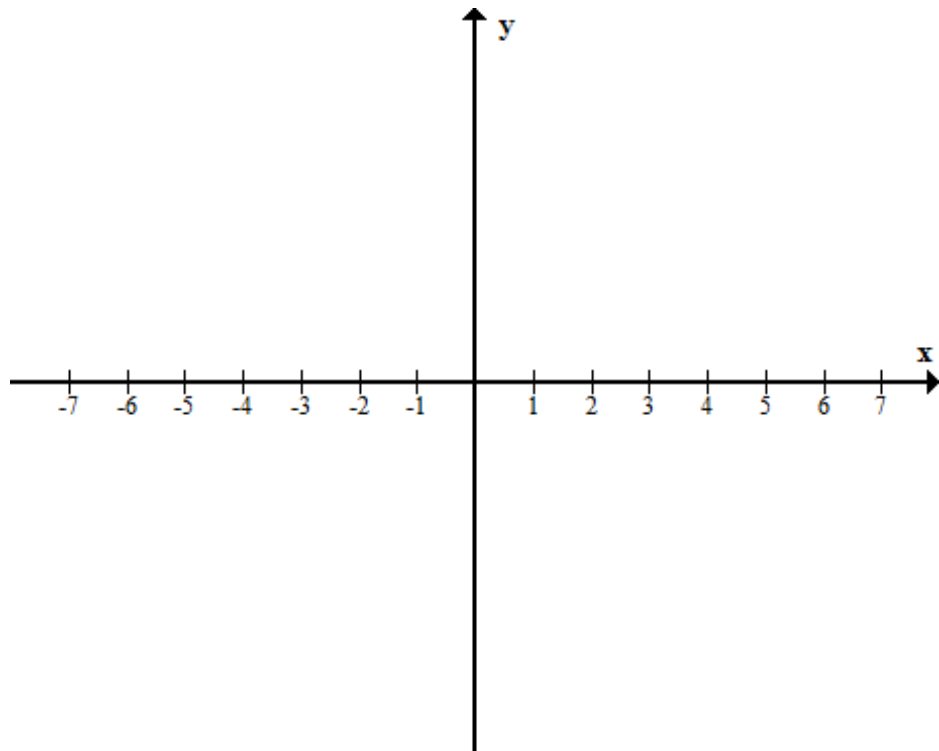
Test # 2

There are 6 problems for a total of 110 points. **Show your work**; an answer alone, even correct, will get no credit. An illegible answer will not be graded, so write your work neatly. Organize your work, so it is clear what you do and why. It might be necessary to use English sentences to write explanations.

Problem 1. (15 pts) Find the zeros and their multiplicity of the polynomial function

$$f(x) = -3x^2(x-3)(x+4)^3(x^2+5)$$

Determine the end behavior of f , that is, give the equation of the function that $f(x)$ resembles when $|x|$ is large. Sketch the graph of $f(x)$. **Organize your work. Make sure to label each of your responses.**



Problem 2. (30 pts) Given function $f(x) = \frac{4-x^2}{x^2-3x-4}$. Sketch the graph of $y = f(x)$, by following the steps below.

Show your work and write your conclusions.

a) Find the domain of f

b) Find the y -intercept, if any

c) Find the x -intercepts, if any

d) Find the vertical asymptotes, if any

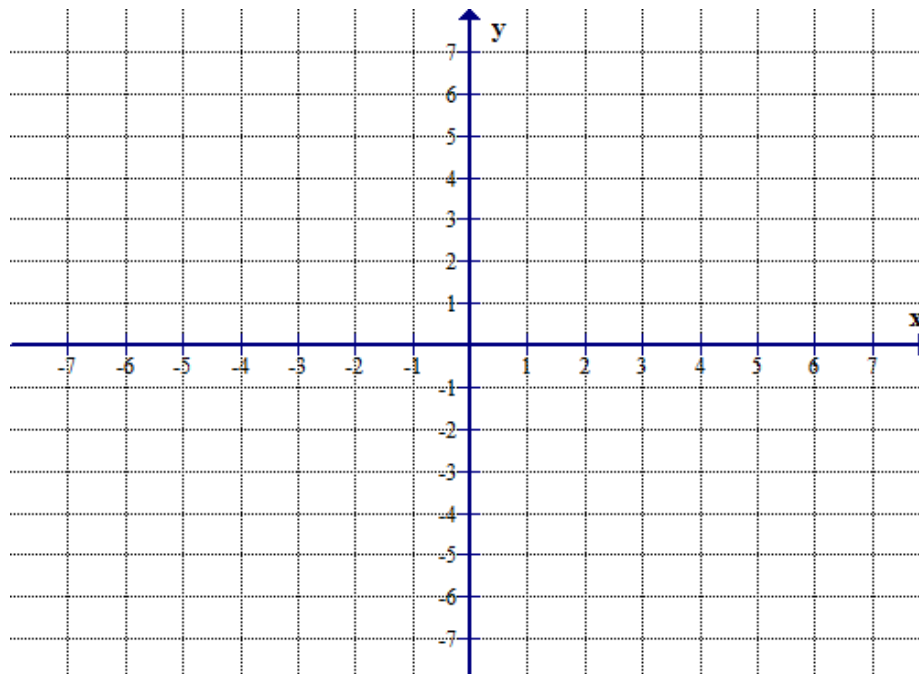
e) Find the horizontal or oblique asymptote, if any

f) Find the points, if any, where the graph crosses horizontal/oblique asymptote

g) Check whether the graph is symmetric with respect to the y -axis or the origin. Make sure to justify your answer and write the conclusions.

h) Make the sign chart for $f(x)$ and determine where the graph is above x -axis /below x -axis

i) Use the information above to sketch the graph of f



Problem 3. (13 pts) Find the vertical and horizontal/oblique asymptotes of

$$f(x) = \frac{2x^3 - 3x^2 - 18x + 27}{2x^2 - x - 3}$$

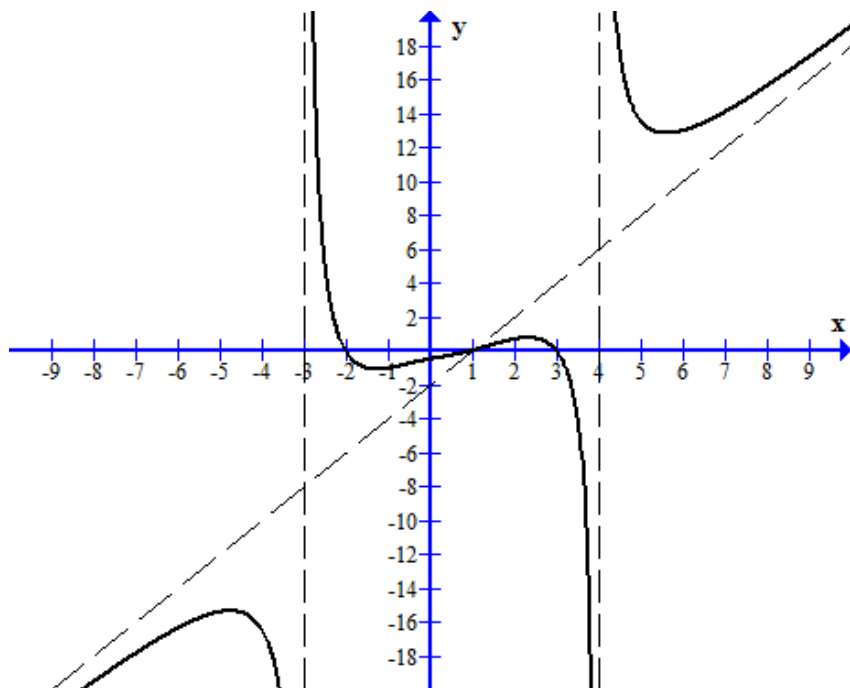
Problem 4. (26 pts) Solve the following inequalities

a) $\frac{x^2}{x-4} \leq -2$

b) $2x^4 + 3x^2 - 20x > 0$

Problem 5. (13 pts) Find the domain of $f(x) = \sqrt{\frac{x^2 - 11x + 28}{x^2 - 1}}$

Problem 6. (13 pts) The graph of function $f(x) = \frac{2x^5 - 4x^4 - 8x^3 + 8x^2 - 10x + 12}{x^4 - x^3 - 10x^2 - 2x - 24}$ is given below. Answer the questions that follow



- What is the domain of f ?
- Write the equation(s) of the vertical asymptotes, if any
- Write the equation of the horizontal/oblique asymptote, if any
- Use the graph of f , to solve the inequality

$$\frac{2x^5 - 4x^4 - 8x^3 + 8x^2 - 10x + 12}{x^4 - x^3 - 10x^2 - 2x - 24} \leq 0$$