Math 123 Exam 1A

March 10, 2010 Professor Ilya Kofman

NAME: _____

1. (*20 points*) Answer questions about the following curves or functions. Show your work!

(a)

$$x^2y + y^2x = 0$$

(i) Is this symmetric with respect to the x–axis? _____
(ii) Is this symmetric with respect to the y–axis? _____
(iii) Is this symmetric with respect to the origin? _____
(iv) Why is this NOT the graph of any function $y = f(x)$?

(b)

$$f(x) = 0.6x^5 - 3x^3 - 1$$

(i) Is the function $f(x)$ even, odd or neither? _____
(ii) What is the y–intercept of $f(x)$? _____
(iii) Use your calculator to sketch the graph of $y = f(x)$.
(iv) Use your calculator to find all the zeros of $f(x)$.

2. **(a)** (*10 points*) Find the solutions of the equation $6x^2 - 17x + 12 = 0$.

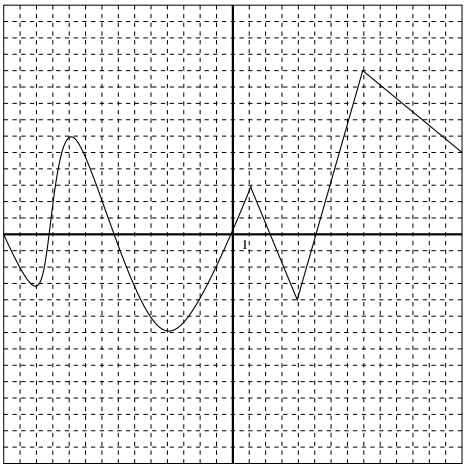
(b) (*10 points*) Find the domains of the functions $f(x) = \dfrac{x+1}{x^2 - 5x + 6}$ and $g(x) = \sqrt{4x + 28} - x^2$.

3. (*20 points*) Find the equations of the following lines. Write your final answer in the slope-intercept form.

(a) The line passing through points $(1, -2)$ and $(4, 3)$.

(b) The line passing through the point $(5, -2)$ and perpendicular to the line $2x - 3y = 4$.

4. **(a)** (*10 points*) Let $y = f(x)$ be the graph given below.



(i) Write the values $f(-1), f(3), f(-8)$.

(ii) Write the coordinates (i.e. (x,y)) of the relative maxima.

(iii) Write the coordinates (i.e. (x,y)) of the relative minima.

(b) (*10 points*) Draw the line $y = -\frac{2}{3}x - 4$ on the grid above. At how many points will the line intersect the graph of $y = f(x)$?

5. (*20 points*) Match the lines with their graphs in (a)–(d).

(a) $2x + 3y = 6$ Graph: _____ (b) $2y + 3x = 0$ Graph: _____

(c) $2x - 3y = 6$ Graph: _____ (d) $3y = 4x$ Graph: _____

(e) Find the equation of the line in the last graph. _____