V1

M	1	2	3	4	5

Last Name:________________

First Name:________________

ID:________________ Section:____

Math 1051 Midterm #3. April 19, 2002

Attention! Please, note that this is the closed book test. You are not allowed to use graphing calculator. Simple calculators are allowed. Please, show all important steps in you solution but do not make your solution excessively long.

a. Mark which of the following statements is true about the rational function

$$R(x) = \frac{x^3 - 4x^2 - 5x + 3}{x^2 + x - 1}.$$

☐ $R(x)$ has horizontal asymptote $y = 1$;

☐ $R(x)$ has oblique asymptote $y = x + 3$;

☐ $R(x)$ has oblique asymptote $y = -x + 5$;

☐ $R(x)$ has oblique asymptote $y = x - 5$;

☐ $R(x)$ has oblique asymptote $y = x - 3$.

b. State the leading term of the polynomial

$$(5x^3 + 3x^2)(2x + 5)(-x^2 - 7x - 2)$$

☐ $70x^5$;

☐ $100x$;

☐ $-10x^6$;

☐ $-12x^6$;

☐ $60x^5$.

c. Domain of the rational function

$$R(x) = \frac{x^2 - 3x - 4}{x^2 - 9x + 20}$$

- ☐ is $x > 0$;
- ☐ is $x \neq 4$;
- ☐ is $x \neq 5$ and $x \neq 4$;
- ☐ is $x < 0$;
- ☐ is $x \neq 3$ and $x \neq 4$.

d. Which from the following is the inverse function to

$$y = x^2 - 1, \qquad x > 0.$$

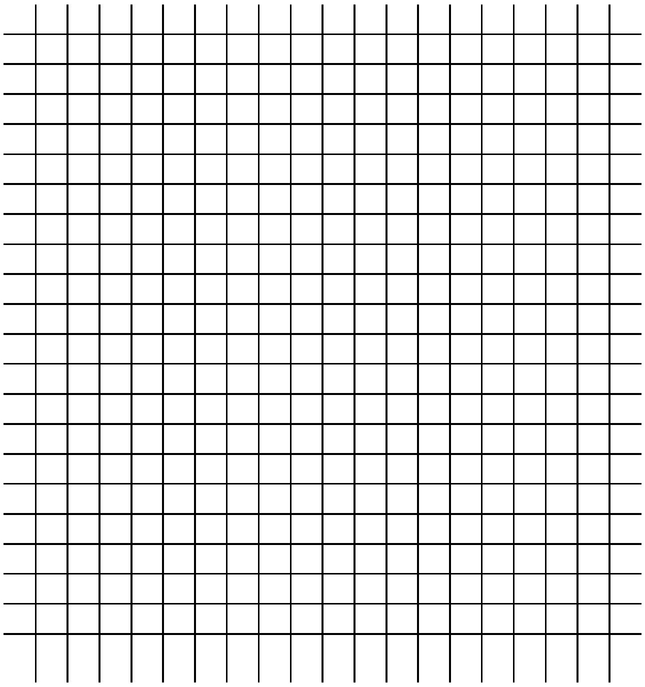
- ☐ $\frac{1}{x^2 - 1}$;
- ☐ $\sqrt{x + 1}$;
- ☐ $\sqrt{x^2 + 1}$;
- ☐ $\sqrt{x - 1}$;
- ☐ $\frac{1}{x^2 + 1}$.

1. Find the point of maximum of the quadratic function. Give the value of the function at that point.

$$f(x) = -3x^2 + 12x + 1.$$

2. Graph the rational function

$$R(x) = \frac{(x+3)(x^2-4)}{x^2-3x+2}.$$



3. Solve rational inequality

$$\frac{x+1}{x-1} > \frac{x+3}{x-2}.$$

4. Find the inverse function to the function

$$f(x) = \frac{x-3}{x-5}$$

5. Solve exponential equation

$$2^{x^2} = 8(4^x).$$