Name:

Recitation Instructor:

Recitation Day & Time:

Total/100	Grade

MATH 100 College Algebra – **Exam I**

7:15–8:15pm, Tuesday September 13, 2005

Check that that you have all three pages. SHOW ALL YOUR WORK.

1. (6 points) Simplify $\dfrac{(y^3/x)^2}{(x^3y^{-2})^{-3}}$ avoiding negative exponents (you may assume that $x, y \neq 0$):

2. (8 points) Write as a rational power of a (assume a is positive):

(i) $\dfrac{\sqrt{a^3}}{\sqrt[3]{a^2}}$

(ii) $\sqrt[5]{a^3\sqrt[3]{a}}$

3. (7 points) Simplify by extracting squares (y could be negative in (a)):

(a) $\sqrt{\dfrac{y^6}{16}} =$

(b) $8\sqrt{12} - 3\sqrt{75} =$

4. (5 points) Multiply out and write the polynomial in standard form: $(x^2 - x + 5)(x^2 - x - 5)$.

5. (6 points) Simplify: $\dfrac{x^3 - 6x^2 + 9x}{x^3 - 9x}$.

PG SCORE/32

6. (16 points) Factor the following polynomials as far as possible:

(a) $2x^2 + 7x - 15 =$

(b) $16x^2 - 9 =$

(c) $(x-1)^3 - (x-1)(x^2-5) =$

(d) $x^3 - 3x^2 - 4x + 12 =$

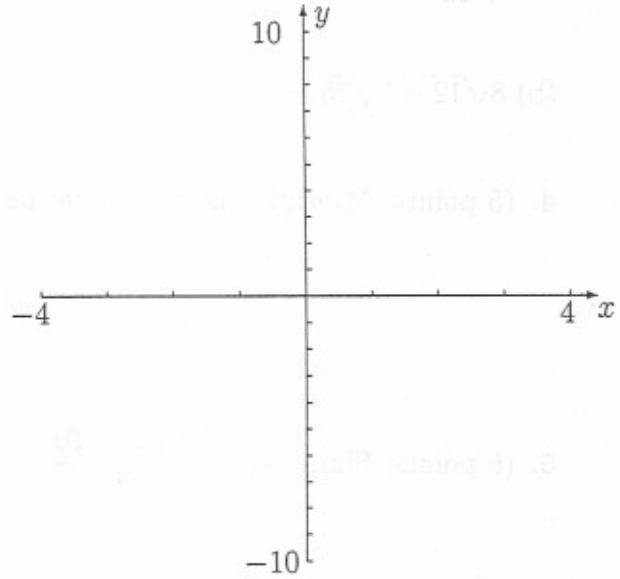
7. (6 points) Simplify: $\dfrac{\dfrac{1}{y} - \dfrac{4}{y+3}}{\dfrac{y-1}{y+3}}$.

8. (7 points) Perform the subtraction and simplify: $\dfrac{5}{x^2 - x - 6} - \dfrac{2}{x^2 - 4x + 3}$.

9. (8 points) Use your calculator to graph

$$y = x^3 + x^2 - 4x - 3,$$

with the window settings shown.
Find the coordinates of any intercepts correct to three decimal places:



x-intercepts=_____

y-intercept=_____

PG SCORE/37

10. (7 points) (a) What is the distance between the points $(-2, 1)$ and $(3, -1)$?

(b) Find an equation for the circle with center $(3, -1)$ which passes through the point $(-2, 1)$.

11. (5 points) Rationalize the denominator and simplify: $\dfrac{2-\sqrt{5}}{2+\sqrt{5}}$.

12. (4 points) Find the slope of the line passing through $(1, -5)$ and $(-1, 3)$.

13. (6 points) Suppose that a textbook costs \$40 in 1990 and \$115 in 2005 and that the cost is rising linearly with time.
(a) What is the rate of increase in the price of the textbook?

(b) Give a linear function representing the cost of the textbook x years after 1990.

14. (4 points) What is the domain of the function $f(x) = \dfrac{x^3+x}{x^2-7x+6}$?

15. (5 points) Let $g(x) = x^2 - 6x + 3$. Find and simplify $g(3-x)$.

PG SCORE/31