Name:

Recitation Instructor:

Recitation Day & Time:

Total/100	Grade

MATH 100 College Algebra – **Exam I**

7:15–8:15pm, Tuesday February 7, 2006

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

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1. (6 points) Simplify $\dfrac{(x^{-1}y^3)^2}{(yx^{-3})^3}$ 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) $\dfrac{\sqrt[4]{a^2}}{\sqrt[3]{a}}$

(ii) $\sqrt[7]{a^2\sqrt[4]{a}}$

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

(a) $\sqrt{y^8} =$

(b) $7\sqrt{28} - 3\sqrt{63} =$

4. (5 points) Multiply out and write the polynomial in standard form: $(2x^2 - x + 7)(2x^2 + x + 7)$.

5. (6 points) Simplify: $\dfrac{x^2 - 5x - 14}{2x^2 - 14x}$.

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6. (12 points) Factor the following polynomials as far as possible:

(a) $3x^2 + x - 2 =$

(b) $25x^2 - 16 =$

(c) $4(x-6)^3 + (x+1)(x-6)^2 =$

7. (7 points) Simplify: $\dfrac{\dfrac{5}{a+2} - \dfrac{4}{a+1}}{\dfrac{a+2}{a+1}}$.

8. (7 points) Perform the addition and simplify: $\dfrac{4}{z^2-9} + \dfrac{2}{z^2-9z+18}$.

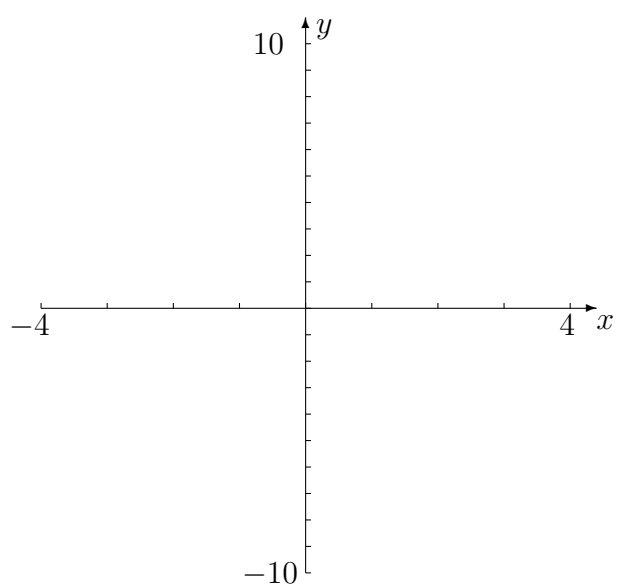
9. (8 points) Use your calculator to graph

$$y = x^3 - x^2 - 6x + 1,$$

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

x-intercepts=_____

y-intercept=_____



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10. (9 points) The points $(3, -1)$ and $(-1, 1)$ are endpoints of the diameter of a circle.

(a) What is the length of the diameter?

(b) What is the center of the circle?

(c) Write down an equation of the circle.

11. (5 points) Rationalize the numerator: $\dfrac{8+\sqrt{3}}{6-\sqrt{3}}$.

12. (6 points) (a) The slope of the line passing through $(-2, 8)$ and $(4, 2)$ is $m =$ _____.

(b) Find an equation for the line passing through the two points in part (a).

13. (6 points) (a) The slope of the line $2x + 5y = 1$ is $m_1 =$ _____.

(b) The slope of a line perpendicular to the line in (a) is $m_2 =$ _____.

14. (4 points) What is the domain of the function $f(x) = \dfrac{x^2+x}{x^2+5x-6}$?

15. (4 points) Let $g(y) = y^2 + 3y - 2$. Find and simplify $g(y-4)$.

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