

Name: -----
Shirin Malekpour
October 11, 2005

Math 114
Exam I

TA (Circle One): **Daphne Franklin**
Frank Thorne

Kathleen Kiernan
Brian Weber

I	21 Points	
II	14 Points	
III	20 Points	
IV	15 Points	
V	15 Points	
VI	15 Points	
Total	100 Points	

WRITE YOUR NAME AND CIRCLE YOUR TA'S NAME ON EVERY ANSWER SHEET.
SHOW YOUR REASONING. YOU NEED TO SHOW WORK TO GET FULL CREDIT. NO CALCULATORS ARE ALLOWED. WRITE YOUR FINAL ANSWERS IN THE BOXES PROVIDED.

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I. (21 points.) Simplify. Do your work at the bottom of the page and write your final answer in the boxes provided. This is an all or nothing problem

1. $(4a^2b)^4\left(\frac{-a^3}{2b}\right) =$

2. $(8r)^{\frac{1}{3}}(2r^{\frac{2}{5}}) =$

3. $\sqrt[5]{\frac{3x^4y^3}{9x^2}} =$

4. $\sqrt{x^4y^{10}} =$

5. $\frac{2x+6}{x^2+6x+9} + \frac{5x}{x^2-9} + \frac{7}{x-3} =$

6. $\frac{\frac{x}{y^2} - \frac{y}{x^2}}{\frac{1}{y^2} - \frac{1}{x^2}} =$

7. $(\sqrt{x} + \sqrt{y})^2(\sqrt{x} - \sqrt{y})^2 =$

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II. (14 points.) A box with a square base and no top is to be made from a square piece of tin by cutting out a 3-inch square from each corner and folding up the sides. If the box is to hold 48 in^3 , what size piece of tin should be used?

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III. (20 points.)

(A) If $f(x) = \sqrt{x}$ and $g(x) = x^2 - 16$ compute $g \circ f(x)$. What is the domain of $g \circ f(x)$?

(B) Find the domain of $h(x) = \frac{1}{\sqrt{(x+2)(3-x)}}$.

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IV. (15 points.) Find the equation of the perpendicular bisector of the line segment between $(4, -3)$ and $(6, 1)$.

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V. (15 points.) Graph $y = 3(x + 1)^2 - 2$ starting with the graph of $y = x^2$. Explain what you are doing.

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V. (15 points.) Find the vertex, $f(\text{vertex})$, x-intercept(s), y-intercept of $f(x) = 2x^2 - 6x + 4$. Is $f(\text{vertex})$ the minimum or maximum value of the function? Why?