

MIDTERM 2

Math 110 (Doherty)
February 26, 2007

Name _____

INSTRUCTIONS: PLEASE READ THIS FIRST:

1. Make sure you have a complete exam. The exam has 7 pages, counting this cover page.
2. Show all your work. Use the back of an adjacent page if you need more space.
3. You have 65 minutes.
4. You are not allowed to use a calculator of any kind.
5. If you have questions, raise your hand and I will assist you as soon as possible.

Good Luck.

Problem	Total Points	Score
1	8	
2	12	
3	18	
4	8	
5	12	
6	7	
7	6	
8	16	
9	13	
Total	100	

1. (4 pts each) Simplify each expression. There should be no negative exponents in your answers.

(a) $\left(\frac{1}{3} + \frac{1}{6}\right)^{-2}$

(b) $\frac{(3^{2-b})^{-2}}{(3^2)^{-b}}$

2. (6 pts each) Simplify each expression. There should be no negative exponents in your answers. You do not have to expand terms like 2^5 .

(a) $\frac{(-2a^{-2}b^3)^{-1}(-5a^2b)}{6a^{-3}b^2}$

(b) $(x^{-2}y^3)\frac{(3x^{-3}y^2)^{-1}}{(3x^2y^{-1})^2}$

3. (6 pts each) Solve by factoring. State the solution set.

(a) $2x^2 + 10x = 12$

(b) $6x^3 + 11x^2 = 2x$

(c) $x^3 + 2x^2 - 16x - 32 = 0$

4. (8 pts) What is the domain of $\frac{2y+3}{y^3-4y}$? State your answer in interval notation.

5. (6 pts each) Perform the indicated operations, and express your answer in its simplest form (i.e., all fractions should be in lowest terms).

(a) $\frac{x^2+6x+8}{6x} \div \frac{3x^2-12}{x^2}$

(b) $\frac{8w}{4w^2+8w+4} - \frac{3w-3}{w^2-1}$

6. (7 pts each) Simplify the following complex fraction; your answer should be in lowest terms:

$$\frac{\frac{3}{3+x} - \frac{4}{3-x}}{\frac{1}{x+3} - \frac{3}{x^2-9}}$$

7. (6 pts) Compute $(-2x^3 - x^2 - 15) \div (x+3)$ using synthetic division. Write your answer as quotient + $\frac{\text{remainder}}{\text{divisor}}$. If $P(x) = -2x^3 - x^2 - 15$, use your result to determine $P(-3)$.

8. (8 pts each) Solve each of the equations. State the solution set for each.

(a)
$$\frac{3}{y-2} + \frac{2y}{y-3} = \frac{6}{y^2 - 5y + 6}$$

(b)
$$\frac{3}{x-2} = \frac{x+2}{7}$$

9. (13 pts) Your trained monkey can trim the hedges around your yard in 15 hours using a manual trimmer. If your chimpanzee helps out with the electric trimmer, the job takes 5 hours. How much time would it take the chimp to do the job alone?