

Math 101

February 22nd, 2005

Exam 1

Name: _____ Instructor and Section: _____

There are 100 possible points on this exam. Be sure to read each question carefully and answer the question asked. Show your work neatly and clearly—untidy answers and/or answers without justification may reduce your score. Partial credit may be given for a correct approach even if you don't get to the right answer. Give exact answers unless otherwise asked.

No calculators are allowed

GOOD LUCK!

Problem	Max	Score
1	8	
2	8	
3	10	
4	10	
5	10	
6	10	
7	10	
8	10	
9	10	
10	14	
TOTAL	100	

1. (8 points) Insert $<$, $>$, or $=$ between each pair of numbers below to make a correct statement.

(a) $(-2)^2$ -2^2

(b) $\frac{1}{\sqrt{2}}$ $\frac{1}{\sqrt{3}}$

(c) $|x - y|$ $|x| - |y|$

(d) $\sqrt{\frac{9}{4}}$ $\frac{\sqrt{9}}{2}$

2. (8 points) Simplify the following expressions. (Give exact values and put all fractions in lowest terms.)

(a)
$$\frac{-3^2 + (-2)^2}{\sqrt{(-3)^2} - 4\left(\frac{1}{2} - \frac{1}{|1-5|}\right)}$$

(b)
$$12\left(\frac{4\sqrt{9} - 2|1 - 6|}{6}\right)$$

3. (10 points) Solve the following equations as directed.

(a) Solve for x .

$$\frac{2x + 5}{5} = \frac{3x + 1}{2} + \frac{-x + 7}{2}$$

(b) If the product of a number and -4 is subtracted from the number, the result is 9 more than the number. Find the number.

4. (10 points) Solve the following inequalities and state the final answer as an interval:

(a) $\frac{3-x}{-2} < \frac{x-2}{4}$

(b) $|2 - 4x| < 2$

5. (10 points) Solve the following inequalities and state your final answer as an interval:

(a) $\frac{|3-4x|+5}{3} > 1$

(b) $2 - 3x \leq 8$ or $-2x + 3 > 5$

6. (10 points) Solve the following equations:

(a) $\frac{|3-x|}{3} = 1$

(b) $|2x + 4| = |2 - 4x|$

7. (10 points) At the end of the day, John has to open the register and sort out the money. This one day there were \$78 in the register. Knowing that the number of \$1 bills was 3 more than twice the number of \$5 bills and that the number of \$10 bills was 2 less than the number of \$5 bills, find how many bills of each denomination were in the register. (You should assume that the only type of bills were 1's, 5's and 10's)

8. (10 points) On an automobile trip, Aimee maintained a steady speed for the first two hours. Rush-hour traffic slowed her speed by 25 mph for the last part of the trip. The entire trip, a distance of 125 mi, took 2.5 hours. What was her speed during the first part of the trip?

9. (10 points) The weight of an object in Earth is directly proportional to the weight of the same object on the moon. A 250-lb astronaut would weigh 40 lb on the moon. How much would a 90-lb keg weigh on the moon? (Of course, the keg is full of root beer)

10. (14 points)

(a) Write down an equation for the line which contains the point $(2,5)$ and has slope $-\frac{1}{2}$.

(b) What are the x and y intercepts of this line?

(c) Write down the equations for the lines parallel and perpendicular to this one that pass through the point $(5,2)$.