

Department of Mathematics, University of Wisconsin-Madison

Math 101 Test #1

Spring 2010

NAME: \_\_\_\_\_

Instructions:

Time: **1 hour 15 minutes**

No Calculators.

You **must show your work** to receive credit.

1. (16 points) Evaluate. Write your answer in fractions if appropriate.  
Simplify as much as possible:

(a)  $-\frac{2}{3} + \frac{2}{5}$

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

(c)  $-18 - (-12) \div 6$

(d)  $3^{-2} - 2^{-3}$

2. (12 points) Simplify. Write your answer using only positive exponents.

(a)  $-4(-3u - 2y + 3)$

(b)  $(-2x^2y^2z^4)(-2x^3y^3z)^2$

(c)  $\left(\frac{-2a^{-4}b^6}{c^2}\right)^2$

3. (6 points) Ann has scored 7, 5, 8, and 7 on her previous four tests. What score(s) does she need on her next test so that her average is AT LEAST 7?

4. (16 points) Solve the following equations:

(a)  $2(x + 2) = 8x + 5 + 2(3x - 8)$

(b)  $\frac{2y-4}{5} = \frac{5y+13}{4} + \frac{y}{2}$

(c)  $5(x + 1) - 7 = 3(x - 1) + 2x$

5. (6 points) Elyse rented a car for one day. There was a base fee of \$20.00 and there was an additional charge of \$0.50 for each mile driven. Elyse had to pay \$56.00 when she returned the car. How many miles did she drive the car? Note: You must write an equation to solve this problem. Trials and errors will not be granted credits.

6. (4 points) Solve the following equation for x.

$$T = \frac{1}{6}(x - y + z)$$

7. (6 points) The entire graph of the function  $H$  is shown in the figure below. Write the domain and range of  $H$  using interval notation.

Domain:

Range:

8. (5 points) Write the domain of  $f(x) = \sqrt{3x - 18}$  using interval notation.

9. (6 points) Write equations for the vertical and the horizontal lines passing through the points  $(-3,-1)$ .

Vertical Line:

Horizontal Line:

10. (5 points) Solve the inequality:

$$-18 \geq 14 - 4w$$

Write your answer in interval notation.

11. (6 points) The sets L and J are given below.

$$L = \{a, g, i\}$$

$$J = \{c, g, i\}$$

What is the union ( $\cup$ ) of the sets L and J?

What is the intersection ( $\cap$ ) of the sets L and J?

12. (12 points) The graph of the function  $f$  is shown below:

(a) Find the slope of the line.

(b) Find the equation of the line. Write your answer in standard form.

(c) What is the x-intercept? You need to determine it algebraically and not just graphically.