

MATH 65 LAB No. 2
EXAM I REVIEW

Name _____

Instructor: T. Henson

DUE: Monday, February 13, 5:00 p.m.

Purpose: Review key concepts and processes from Chapter One and Chapter Two, Sections One – Three. Build basic skills in using the order of operations, evaluating expressions, simplifying expressions and solving equations.

PART I. REAL NUMBER PROPERTIES

Match each expression with one of the mathematical properties in the right-hand column by writing the appropriate letter in the blank provided. A property may apply to more than one expression.

EXPRESSION	MATHEMATICAL PROPERTY
_____ $3(x + 2) = 3x + 6$	A. Commutative Property
_____ $\frac{1}{mn}(mn) = 1$	B. Associative Property
_____ $3 \cdot 4 = 4 \cdot 3$	C. Distributive Property
_____ $\frac{5}{0}$	D. Additive Identity
_____ $0 + 7 = 7$	E. Multiplicative Identity
_____ $(3 + 4) + 5 = 3 + (4 + 5)$	F. Additive Inverse
_____ $-4 \cdot 1 = -4$	G. Multiplicative Inverse
_____ $2(3x) = (2 \cdot 3)x = 6x$	H. Undefined
_____ $(-5) + 5 = 0$	

PART II. REAL NUMBERS

1. Identify each of the following numbers as prime, composite or neither. If the number is composite, rewrite the number as a product of primes.

a. 54

b. 17

c. 1

d. 360

2. For the following problems refer to the set:

$$\left\{-3.5, -3.\bar{5}, -4, \frac{2}{3}, 0, 2, -1\frac{1}{3}, |-2.8|, \pi, \sqrt{25}\right\}$$

List the numbers that are:

- a. Natural numbers
- b. Whole number
- c. Integers
- d. Rational numbers
- e. Irrational numbers

Graph the numbers on the number line:

3. Insert one of the symbols $<$, $>$ or $=$ between each pair of numbers. Show your thinking.

(a) $-(-7)$ $|-7|$

(b) $-\frac{2}{3}$ $-\frac{4}{9}$

(c) -0.25 -0.3

PART III. OPERATIONS WITH SIGNED NUMBERS and ORDER OF OPERATIONS

1. In the expression $(-6)^2$, what is the base? _____

In the expression -6^2 , what is the base? _____

Is $(-6)^2$ equal to -6^2 ? Why or why not?

2. Perform the indicated operations. Fractions must be reduced to lowest terms.
SHOW ALL STEPS OF YOUR WORK/THINKING. DO NOT use a calculator.

a. $\frac{8}{15} + \frac{5}{12}$

b. $\frac{4}{9} - \frac{11}{18}$

c. $\frac{8}{11} \cdot \left(-\frac{33}{24}\right)$

d. $-\frac{7}{25} \div \left(-\frac{14}{5}\right)$

3. Use the order of operations and the rules for operations with signed numbers to simplify. **SHOW ALL STEPS OF YOUR WORK/THINKING. DO NOT** use a calculator.

a. $18 - 7 \cdot 2 + 6$

b. $12 + 8^2 \cdot (-5) - 4$

c. $30 - 3(4 + 2)$

d. $15 - 2(-5) - (20 - 4) \div 8$

e. $16 \div 2^2(6) - (35 - 7) \div 4$

f. $\frac{-2 \cdot 7 + 3^2}{(6 - 11)^2}$

4. Find the value of each expression for the given values of the variables.

a. $3x - 4y + 3$, $x = -2$, $y = -3$

b. $\frac{m - n}{n - 3m}$, $m = -3$, $n = 2$

PART IV: ALGEBRAIC EXPRESSIONS AND SOLVING LINEAR EQUATIONS

1. Simplify each expression by using the distributive property to remove parenthesis.

a. $4(w - 12)$

b. $-8(x - 3)$

c. $3(a - 2b + 7)$

2. Simplify each expression by combining like terms. Use the distributive property as needed.

a. $-8x + 6x - 10x$

b. $9y - 7 + 4y + 15$

c. $3(q + 4) + 5(q - 6)$

d. $7x - 3(x + 5) + 10$

3. Solve each equation and CHECK the result. Make sure you show ALL your steps/thinking!

a. $3 - 5x = 28$

b. $9y - 6 = 12y + 6$

c. $-\frac{2}{5}x = \frac{8}{15}$

d. $2(x-4) + x = 7$

4. Solve each equation. If there is no solution or an infinite number of solutions, then state that conclusion.

a. $\frac{y}{7} = \frac{y}{2} - \frac{5}{2}$

b. $2(3x+1) = 6x+2$

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

d. $4(x-2) = 3(x-5)$

e. $3a - (6a + 5) = 2(a + 3) - 4a$

5. Write an arithmetic expression for the phrase, “The difference of 9 and the sum of 4 and 11.” Simplify the expression.

6. Translate each of the verbal models into mathematical models. Be sure to identify what your variables represent.
 - a. Twice a number less the number squared.

 - b. The width of a rectangle is 5 less than half the length. Write an expression for the width of the rectangle.

PART V: SOLVING APPLIED PROBLEMS

Solve each of the following applied problems. **Show all steps of your work/thinking. No credit for answers without supporting work.**

1. 4.81 is 2.5% of what number?

2. A collector of football trading cards paid \$6 for a 1984 Dan Marino rookie card several years ago. If the card is now worth \$100, what is the percent of increase in the card’s value? (Round to the nearest one percent.)

3. In one week the price of whole bean coffee dropped from \$8 per pound to \$7.60 per pound. What was the percent of decrease?

For each word problem below:

- Choose a letter to represent one of the unknowns in the problem. Then, if necessary, represent any other unknowns with expressions that use the same letter.
- Write an equation that can be used to solve the problem.
- Solve the equation and answer any questions asked in the problem.

NO CREDIT for solutions that do not include these steps.

You may use a calculator to assist you with calculations, but you must show all steps of your work to receive credit.

4. Find two consecutive natural numbers such that when the smaller is added to twice the larger, the result is 30 more than the smaller number.
5. An 18 ounce can of condensed chicken broth is 20% sodium (by volume). When water is added to the broth according to package directions, the sodium content is reduced to 12% sodium (by volume). How much water should be added to the can of chicken broth?

6. Forty ounces of a solution is 28% pure antifreeze (by volume). How much water should be added to the solution to reduce the concentration to 20% antifreeze (by volume)?
7. A bus is traveling from city A to city B. The two cities are 195 miles apart. During the first part of the trip the bus averages 70 miles per hour but then encounters traffic and travels at a slower speed for the rest of the trip. If it took the bus 3.5 hours to complete the trip and the bus traveled for 1.5 hours at 70 miles per hour, find the average speed of the bus for the remainder of the trip.