

NAME: \_\_\_\_\_ Score \_\_\_\_\_ /100  
Please print

SHOW ALL YOUR WORK IN A NEAT AND ORGANIZED FASHION

2 points each for questions 1 – 32. 5 points each for questions 33 – 39.

Circle T or F, whichever is correct.

1. T **F**  $3 - 4 = 12$ .
2. T **F**  $\mathbf{R} \subset \mathbf{Q}$ .
3. T **F**  $\{x|x \in \mathbf{R} \text{ and } 1 < x \leq 5\} = (1, 5)$
4. **T** F  $\sqrt{7}$  is a real number.
5. T **F**  $3 - (4 - 5) = 3 + (-4 - 5)$ .
6. T **F** The opposite of  $\frac{11}{7}$  is  $\frac{7}{11}$ .
7. **T** F If x represents a negative number, then the absolute value of x is the opposite of x.
8. T **F** (5, 3) is acceptable interval notation.
9. T **F** If x is a real number, then  $-x$  is negative.
10. T **F** On the real number line the relation “less than” means “is to the right of”.

Fill in each of the blanks to make the statements true.

11. A **set** is a collection of objects.
12. The formula for the area of a circle is  $\mathbf{A} = \pi r^2$ .
13. The set A is a subset of the set B if every element of set **A** is an element of set **B**.
14. In the expression  $3^5$ , 3 is the **base** and 5 is the **exponent**.
15.  $\frac{0}{4}$  is **0**.
16. The product of two real numbers with different signs is **negative**.
17. The transitive property of equality states that if  $a = b$  and  $b = c$ , then  **$a = c$** .
18. A real number which is not rational is **irrational**.

19.  $\frac{4}{0}$  is **undefined**.

20. Absolute value is defined by  $|x| = \begin{cases} x & \text{if } x \geq 0 \\ -x & \text{if } x < 0 \end{cases}$

21. Complete the statement of the Law of Trichotomy.

If a and b are real numbers, then one and only one of the following is true:

i)  **$a < b$**

ii)  **$a = b$**

iii)  **$a > b$**

22. If a and b are real numbers and  $ab = 0$ , then  **$a = 0$**  or  **$b = 0$** .

23. The property of the real numbers which justifies  $3(x + 2y) = 3x + 6y$  is the **Distributive** property.

24. Simplify  $6x^2 + 2 - 4(x^2 + 1)$ . Your work should be shown as a “chain” of equalities. I will start it and end it for you. You should fill in the missing steps.

$$6x^2 + 2 - 4(x^2 + 1) = 6x^2 + 2 - 4x^2 - 4 = 2x^2 - 2 = 2(x^2 - 1).$$

25.  $\frac{0}{-3} = 0$

26.  $(-2)^4 = 16$

27.  $-7^2 = -49$

28.  $(5)^0 = 1$

29.  $-8 - (-10) = 2$

30.  $3(5 - 7)^2 = 12$

31.  $\{x \in W \mid x > 8\}$  is an example of **set builder** notation for a set.

32.  $[3, 5)$  is an example of **interval notation** notation.

Show your work on exercises 33 – 39 inclusive (5 pts each). **No work –No Credit Be neat!**

33.  $25 - [(3 - 5) + (14 - 18)]^2 = 25 - [-2 + (-4)]^2 = 25 - [-6]^2 = 25 - 36 = -11.$

34. Simplify the expression  $3x - 2(x - 5) + x = 3x - 2x + 10 + x = 2x + 10.$

35. Simplify  $-4 + 6 - 3 - (-14) = -4 + 6 - 3 + 14 = 2 - 3 + 14 = -1 + 14 = 13.$

36. Calculate the area of a trapezoid whose height is 5 and its bases are  $B = 4$  and  $b = 6$ . State the formula and then use the formula.  $A = \frac{1}{2}(B + b)h$

$$A = \frac{1}{2}(6 + 4)5 = \frac{1}{2}(10)5 = (5)(5) = 25$$

37. Simplify  $\frac{\left(\frac{1}{2}\right)^{12-7}}{3 + \left(\frac{1}{3}\right)^9} = \frac{6-7}{3+3} = \frac{-1}{6}$

38. Complete the following diagram to convert the subtraction problem to an equivalent addition problem.

$$\begin{array}{r} -2 \quad - \quad (-7) \\ \downarrow \quad \downarrow \quad \downarrow \\ -2 \quad + \quad 7 \end{array}$$

39. Complete the following diagram to convert the division problem to an equivalent multiplication problem.

$$\begin{array}{r} -\frac{3}{4} \div \left(-\frac{5}{7}\right) \\ \downarrow \quad \downarrow \quad \downarrow \\ -\frac{3}{4} \cdot \left(-\frac{7}{5}\right) \end{array}$$