

NAME: _____ Score _____ /100
Please print

SHOW ALL YOUR WORK IN A NEAT AND ORGANIZED FASHION

Circle T or F, whichever is correct. (2 pts each)

1. T **F** $5 - 4 = -20$.
2. T **F** Every rational number is an integer.
3. **T** F $\{x | x \in \mathbb{R} \text{ and } 7 \leq x < 12\} = [7, 12)$
4. T **F** $\sqrt{3}$ is a rational number.
5. T **F** $5 - (-7 - 2) = 5 + (7 - 2)$.
6. T **F** The reciprocal of $\frac{3}{19}$ is $-\frac{19}{3}$.
7. T **F** $\frac{2}{3} + \frac{4}{5} = \frac{6}{8}$.
8. **T** F The set $\{x | x \text{ is an integer less than } 3\}$ contains a negative number.
9. **T** F If x is a real number and $x < 0$, then $-x$ is positive.
10. **T** F $-5^4 = -625$.
11. (3 pts) Check each of the following which are equal to the interval $[4, 7]$.

<input type="checkbox"/> $\{x 4 < x < 7\}$	<input type="checkbox"/> $\{x 4 \leq x < 7\}$	<input type="checkbox"/> $\{4, 5, 6\}$
<input type="checkbox"/> $\{x 4 < x \leq 7\}$	<input checked="" type="checkbox"/> $\{x 4 \leq x \leq 7\}$	<input type="checkbox"/> $\{5, 6, 7\}$
<input type="checkbox"/> $[7, 4]$	<input type="checkbox"/> $(3, 8)$	<input type="checkbox"/> $\{x x \in \mathbb{N} \text{ and } 4 \leq x \leq 7\}$

12. (3 pts) Check each of the following which are equal to the fraction $\frac{x}{y}$.

<input checked="" type="checkbox"/> $\frac{-x}{-y}$	<input type="checkbox"/> $-\frac{-x}{-y}$	<input checked="" type="checkbox"/> $-\frac{x}{-y}$
<input type="checkbox"/> $-\frac{x}{y}$	<input checked="" type="checkbox"/> $-\frac{-x}{y}$	<input type="checkbox"/> $\frac{-x}{y}$
<input type="checkbox"/> $\frac{x}{-y}$	<input type="checkbox"/> $\frac{y}{x}$	

Fill in each of the blanks to make the statements true. (2 pts each)

13. A **set** is a collection of objects.

14. The formula for the area of a circle is $A = \pi r^2$.
15. Give an example of a binary operation **addition** or **subtraction** or **multiplication** or **division**.
16. In the expression a^b , a is the **base** and b is the **exponent**.
17. Give an example of a unary operation: **forming the opposite**, or **forming the reciprocal**, or **computing square root**, or many other options.
18. The product of two real numbers with the same signs is **positive**.
19. The transitive property of equality states that if $a = b$ and $b = c$, then $a = c$.
20. $\frac{5}{0}$ is **undefined**.
21. On the number line the symbol $<$ means "to the **left** of".
22. Absolute value is defined by $|x| = \begin{cases} x & \text{if } x \geq 0 \\ -x & \text{if } x < 0 \end{cases}$
23. 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) **$a > b$**
24. If a and b are real numbers and $ab = 0$, then **$a = 0$** or **$b = 0$** .
25. The property of the real numbers which justifies $3(x + 2y) = 3x + 6y$ is the **Distributive** property.
26. $\frac{3}{-3} = -1$
27. $(-1)^4 = 1$
28. $-1^2 = -1$
29. $4 - (-12) = 16$
30. $2(5 - 3)^2 = 8$
31. A formula must be an **equation**

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

33. $[3, 5)$ is an example of **interval** notation.

34. In the expression $a \div b$, a is called the **dividend**, b is called the **divisor** and $a \div b$ is called the quotient.

Show your work on exercises 35 – 40 inclusive (5 pts each). No work –No Credit Be neat!

35. $25 - [(3 - 5) + (14 - 18)]^2 = 25 - [(-2) + (-4)]^2 = 25 - [-6]^2 = 25 - 36 = -11$

36. Simplify the expression $5x - 2(7x - 5) + 3x = 5x - 14x + 10 + 3x = 5x - 14x + 3x + 10 = -6x + 10$

37. Simplify $\frac{10 + \left(\frac{1}{4}\right)(12)}{\left(\frac{1}{5}\right)(20) - 5} = \frac{10 + 3}{4 - 5} = \frac{13}{-1} = -13$

38. Calculate the area of a trapezoid whose height is 4 and its bases are $B = 3$ and $b = 7$. State the formula and then use the formula. **State the formula and then use the formula.**

Use the formula $A = \frac{1}{2}(B + b)h$

$A = A = \frac{1}{2}(3 + 7)4 = \frac{1}{2}(10)(4) = 20$

39. Complete the following diagram to convert the subtraction problem to an equivalent addition problem. **(I do not want you to compute the difference.) No work required.**

$$\begin{array}{r} -5 \quad - \quad (-8) \\ \downarrow \quad \downarrow \quad \downarrow \\ -5 \quad + \quad 8 \end{array}$$

40. Complete the following diagram to convert the division problem to an equivalent multiplication problem. **(I do not want you to compute the quotient.) No work required.**

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