Unit 1 Test Study Guide
(Equations & Inequalities)

Name: _____

Date: _____ **Block:** _____

Topic 1: The Real Numbers & Properties

List ALL sets to which each value belongs. (Use *R*, *I*, *Q*, *Z*, *W*, *N*)

1. $\frac{\sqrt{3}}{\sqrt{3}}$	**2.** $5.08\overline{3}$	**3.** $\frac{-\sqrt{256}}{2}$	**4.** 2π

Name the property that justifies each statement.

5. $\frac{x^3}{y} \cdot 1 = \frac{x^3}{y}$	**6.** $6a^2 + ab = ab + 6a^2$
7. $(mn) + -(mn) = 0$	**8.** $\sqrt{7}\left(\sqrt{2} - \sqrt{10}\right) = \sqrt{7} \cdot \sqrt{2} - \sqrt{7} \cdot \sqrt{10}$
9. $5p^2 \cdot (4p \cdot 3) = (5p^2 \cdot 4p) \cdot 3$	**10.** $\frac{1}{9s} \cdot 9s = 1$

Answer true/false. If false, give a counterexample.

11. Perfect squares are closed under multiplication.	**12.** Irrational numbers are closed under division.

Topic 2: Operations & Expressions

Simplify each expression.

13. $\left[18 - (-1-7)^2\right] + 16 \div 2^4$	**14.** $\frac{4 + \sqrt{121} - 2 \cdot 3^3}{\lvert -19 - 2(-8) \rvert}$
15. $10a - 5ab + 4b$ (if $a = \frac{2}{5}$ and $b = -\frac{1}{6}$)	**16.** $\sqrt{\lvert -x^2 - 4y^2 \rvert}$ (if x = 3 and y = -2)

Topic 3: Multi-Step Equations & Word Problems

Solve each equation.

17. $3(7 - 9k) + 23k = 4k - (24 - k)$

18. $7 - \frac{5}{2}(8n - 18) = 14 - 10(2n - 3)$

19. $\frac{7x - 3}{3} = \frac{3x - 4}{8}$

20. If $SA = \frac{1}{2}lp + B$, find p

21. The width of a rectangle is four less than one half the length. If the perimeter of the rectangle is 94 meters, find the area of the rectangle.

22. Find three consecutive odd numbers such that the sum of five times the smaller number and twice the larger number is 33 more than six times the median number.

Topic 4: Absolute Value Equations

Solve each equation. Be sure to check for extraneous solutions.

23. $|-7 - 9x| = 2$

24. $\frac{|5n - 10|}{-2} = -15$

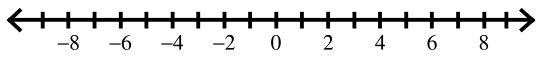
25. $2-10|k+1|=-78$

26. $|2m+7|=6m+13$

Topic 5: Multi-Step Inequalities

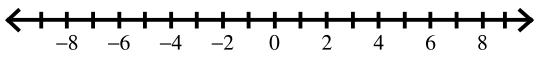
Solve and graph each inequality. Write your answer in interval notation.

27. $33x - 8(3x + 9) > -9$



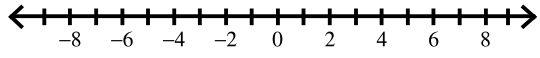
Interval Notation:

28. $-11 - 8k \geq 23 - (7 - 4k)$



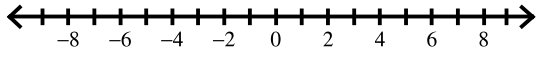
Interval Notation:

29. $11(5u - 4) - 7u \geq 8(6u - 7)$



Interval Notation:

30. $-\frac{5}{3}\left(\frac{9}{10}x+15\right)<7-\left(8-\frac{9}{2}x\right)$

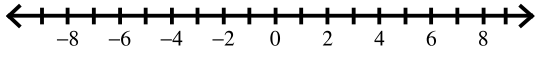


Interval Notation:

Topic 6: Compound Inequalities

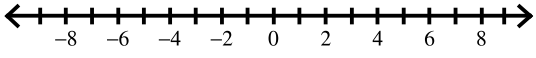
Solve and graph each compound inequality. Write your answer in interval notation.

31. $-18 \leq 2b - 8 < -8$



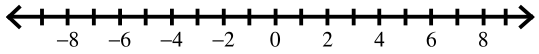
Interval Notation:

32. $m + 5 > 11$ or $8 - 10m \geq 33$



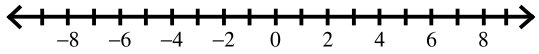
Interval Notation:

33. $7p + 5 \leq -37$ and $-10p < 10$



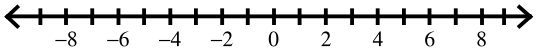
Interval Notation:

34. $7 - 3x \leq -20$ or $5x - 6 \leq 9$



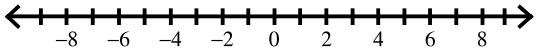
Interval Notation:

35. $9y - 2 < 13$ and $3y - 2 > -29$



Interval Notation:

36. $10 + 2w \geq 22$ or $5w - 8 > -12$

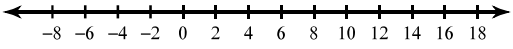


Interval Notation:

Topic 7: Absolute Value Inequalities

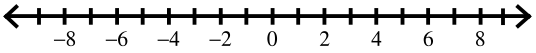
Solve and graph each absolute value inequality. Write your answer in interval notation.

37. $|9 - a| \geq 2$



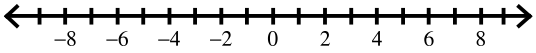
Interval Notation:

38. $\dfrac{|v-3|}{-5} > -1$



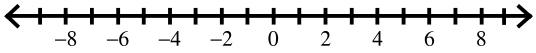
Interval Notation:

39. $|3n + 8| + 1 > 5$



Interval Notation:

40. $-3 - 6|4x - 10| < -87$



Interval Notation: