

Make Sure you review this material in your notes.

Unit 1 Test Study Guide
(Algebra Basics)

Name: Key

Date: _____ Block: _____

The Real Number System

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

1. $-\frac{14}{2}$ <u>Z, Q, R</u>	2. $\sqrt{64}$ <u>N, W, Z, Q, R</u>	3. 0 <u>W, Z, Q, R</u>
4. π <u>I, R</u>	5. $0.\overline{45}$ <u>Q, R</u>	6. $\frac{3}{8}$ <u>Q, R</u>

Place the LETTER of each value its location in the real number system below.

<p>A. $-0.\overline{2}$</p> <p>C. $-\sqrt{100}$</p> <p>E. 0</p> <p>G. -5</p> <p>I. $-\sqrt{72}$</p> <p>K. $\frac{36}{9}$</p>	<p>B. 18</p> <p>D. π</p> <p>F. $2\frac{1}{6}$</p> <p>H. 4.03</p> <p>J. $\sqrt{\frac{4}{9}}$</p>	
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Properties

Identify the property shown below.

7. $4 + (x + y) = (4 + x) + y$ <u>Associative of Add.</u>	8. $\frac{2}{5} \cdot \frac{5}{2} = 1$ <u>Multi Inverse</u>
9. if $\sqrt{49} = 7$ and $7 = 3 + 4$, then $\sqrt{49} = 3 + 4$ <u>Transitive</u>	10. $-28 = -28$ <u>Reflexive</u>
11. $8x^2 \cdot 1 = 8x^2$ <u>Identity of Mult.</u>	12. $10y + (-10y) = 0$ Additive <u>Additive Inverse</u>
13. $(a + 4) \cdot 0 = 0$ <u>Zero Product</u>	14. $-5(x + 7) = -5x - 35$ <u>Distributive</u>
15. $(x + 2) + y = (2 + x) + y$ <u>Commutative of Add.</u>	16. if $x = -1$, then $-1 = x$ <u>Symmetric</u>

Answer True or False. Provide an example if false.

17. The set of negative numbers are closed under division.

False, $\frac{-2}{-2} = 1$

18. The set of whole numbers closed under subtraction.

False, $0 - 1 = -1$

19. The set of integers are closed under multiplication.

True

Absolute Value & Order of Operations

20. $|-21| + |5|$

$21 + 5 = 26$

21. $|-10 - 4|$

$|-14| = 14$

22. $10 - 2 \cdot 3^2 + 13$

$10 - 2 \cdot 9 + 13$
 $10 - 18 + 13$
 $-8 + 13 = 5$

23. $[(-5 + 1) \div 2]^3 - |-7|$

$[-4 \div 2]^3 - 7$
 $(-2)^3 - 7$
 $-8 - 7 = -15$

24. $\frac{25 + 5^2 \div 5}{7 - 12 \div 4 + 2}$

$\frac{25 + 25 \div 5}{7 - 3 + 2} = \frac{25 + 5}{4 + 2}$
 $\frac{30}{6} = 5$

25. $\frac{(3 - 7)^2 + 11}{|-2| + |-1|}$

$\frac{(-4)^2 + 11}{2 + 1} = \frac{16 + 11}{3} = \frac{27}{3} = 9$

Evaluating Expressions

26. $3x^3 - 8y^2$ if $x = 2$ and $y = -3$

$3(2)^3 - 8(-3)^2$
 $3 \cdot 8 - 8(9)$
 $24 - 72 = -48$

$\frac{61}{42}$
 $\frac{-24}{48}$

27. $|a - 4b|$ if $a = 7$ and $b = 2$

$|7 - 4(2)|$
 $|7 - 8|$
 $|-1| = 1$

28. $w^2 + 2xy$ if $x = -3$, $w = -2$, and $y = 1$

$(-2)^2 + 2(-3)(1)$
 $4 + (-6) = -2$

29. $\frac{7c^2 + 5}{4a - b}$ if $a = 1$, $b = -5$ and $c = -4$

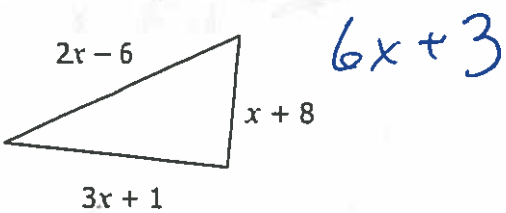
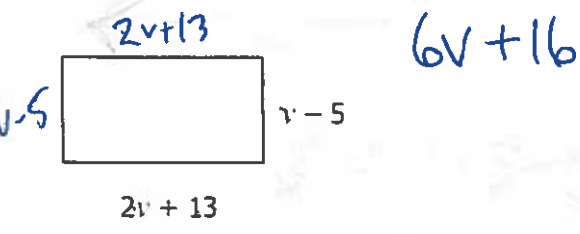
$\frac{7(-4)^2 + 5}{4(1) - (-5)} = \frac{7(16) + 5}{4 + 5} = \frac{112 + 5}{9} = \frac{117}{9} = 13$

$\frac{13}{9817}$

Translating Expressions, Equations, & Inequalities

<p>30. "The product of a number and 7, increased by three."</p> <p>$7n + 3$</p>	<p>31. "One less than twice a number"</p> <p>$2n - 1$</p>
<p>32. "Four times the difference of a number and nine is -30."</p> <p>$4(n - 9) = -30$</p>	<p>33. "Five more than the quotient of a number and eight is 42."</p> <p>$\frac{n}{8} + 5 = 42$</p>
<p>34. "The schola can hold a maximum of 150 people."</p> <p>$s \leq 150$</p>	<p>35. "You must be at least 25 to rent a car."</p> <p>$a \geq 25$</p>

Simplifying Expressions

<p>36. $n + 4 - 9 - 5n$</p> <p>$-4n - 5$</p>	<p>37. $7x - 4y - 8 - 3x - 8y + 12$</p> <p>$4x - 12y + 4$</p>
<p>38. $18 - 2(4x + 7) + 5x$</p> <p>$18 - 8x + (-14) + 5x$</p> <p>$-3x + 4$</p>	<p>39. $9(x - 3) - (x + 2)$</p> <p>$9x - 27 - x + (-2)$</p> <p>$8x - 29$</p>
<p>40. Write the perimeter of the triangle in simplest form.</p> 	<p>41. Write the perimeter of the rectangle in simplest form.</p> 

Two-Step Equations

<p>42. $3x - 7 = 11$</p> <p>$3x = 18$</p> <p>$x = 6$</p>	<p>43. $\frac{x}{4} + 8 = 3$</p> <p>$\frac{x}{4} = -5$</p> <p>$x = -20$</p>
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44. $\frac{2}{5}x - 3 = -17$
 $\quad +3 \quad +3$
 ~~$\frac{2}{5}x = -14$~~
 ~~$x = -14 \cdot \frac{5}{2}$~~
 $x = -35$

45. $9 - 7x = 16$
 $\quad -9 \quad -9$
 $-7x = 7$
 $x = -1$

46. $-12 = 4 - 2x$
 $\quad -4 \quad -4$
 $-16 = -2x$
 $x = 8$

47. $9 - \frac{3}{4}x = 57$
 $\quad -9 \quad -9$
 ~~$-\frac{3}{4}x = 48$~~
 ~~$x = 48 \cdot \frac{4}{3}$~~
 $x = -64$

Solving & Graphing Inequalities

48. $3x + 5 < 14$
 $3x < 9$
 $x < 3$

49. $-5x + 2 \geq 52$
 $\quad -2 \quad -2$
 $-5x \geq 50$
 $x \leq -10$

50. $\frac{x}{-2} + 11 \leq 15$
 $\frac{x}{-2} \leq 4$
 $x \geq -8$

51. $4x - 1 \leq -37$
 $\quad +1 \quad +1$
 $4x \leq -36$
 $x \leq -9$

52. $\frac{5}{8}x - 1 \leq 9$
 ~~$\frac{5}{8}x \leq 10$~~
 ~~$x \leq 10 \cdot \frac{8}{5}$~~
 $x \leq 16$

53. $-4 - \frac{x}{7} < 5$
 $\quad +4 \quad +4$
 $-\frac{x}{7} < 9$
 $x > -7$

54. $\frac{-18 - 2x}{-2} > 4$
 $-18 - 2x > -8$
 $-2x > -14$
 $x < 7$

55. $8 - \frac{3}{2}x \geq -13$
 $\quad -8 \quad -8$
 ~~$-\frac{3}{2}x \geq -21$~~
 ~~$x \geq -21 \cdot \frac{2}{3}$~~
 $x \leq 14$