

Tools of Algebra Test Review Sheet

Directions: Be sure to show all work, communicate your thought process, and justify your reasoning. Remember to check that your answers are complete, correct, and reasonable. If you complete work on scrap paper, please attach it.

1. Each box in the grid below represents the product of the number at the top of the corresponding column and the right of the corresponding row. In each box, write all classifications that apply.

(Choose from: rational, irrational, integer, whole, natural.)

Products of Real Numbers	-2	.333333....	$\sqrt{1}$	$-\sqrt{3}$
3				
$\sqrt{3}$				
$\sqrt{5}$				
-1.5				

2. Use what you know about the properties of numbers to complete each blank.

Appropriately apply the Commutative Property to complete the blank: $3(4x - 9) * -1 = \underline{\hspace{4cm}}$	Appropriately apply the Associative Property to complete the blank: $(34 + 2p) + 3 + (1 - 2) = \underline{\hspace{4cm}}$
Appropriately apply the Multiplicative Identity Property to complete the blanks: $-3 \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$	Appropriately apply the Multiplicative Inverse Property to complete the blanks: $8x \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$
Appropriately apply the Additive Identity Property to complete the blanks: $-7m \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$	Appropriately apply the Additive Inverse Property to complete the blanks: $19 \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

3. Simplify each expression.

a.
$$\frac{-2 + 7 - (3 - 2)}{-4 - (-1 - 3^2 | + 6)}$$

 $+ 4r \div 2r + 1$

b.
$$\frac{qrs}{4} + 9 * -9$$

$q = 3, r = -2, s = -6$

c.
$$|5 + 84 \div -12|^2 - 4 * |-3^3|$$

$r = 7$

4. Solve each equation for z. Be sure to state any restrictions where applicable.

a. $4z - pz = 23 - mn$

b. $r = 2z + 3y - 4$

c. $z/w = x/b$

5. Solve each equation. For one equation, explain how you know for sure that your solution is correct.

a. $-6(2 + 12r) = 28 - r$

b. $5(x + 1.5) - (-4.5x - 2) = \frac{1}{2}x - 1$

c. $3|-8x| + 8 = 80$

d. $-12 + 20(p + 20) = 8 - 10(4p + 22)$

e. $4 - 10|10m - 10| + 6 = -140$

f. $-5|-3v - 9| + 2 = -28$

6. Solve each inequality, & graph the solution on a number line. Draw the number line appropriately.

a. $-1|10b + 7| + 1 > -73$

b. $18|6w - 4| + 12 > 102$

c. $p - 4 \leq -16$ or $2p + 5 > 8$

d. $2n + |5 - 12| < 27 < 15n + 12$

e. $8 + 2|3 - a| \leq 12$

f. $19m - 3(m + 2) \geq 10 + m > 10m - 37$

7. Krista is designing a necklace using some wire. She wants to cut and arrange the wire so that it is in the shape of an isosceles triangle, with a base no shorter than 4 millimeters. She also wants each congruent side of the triangle to be 3 millimeters less than twice the base. Krista has a total of 24 millimeters of wire to work with. Determine the possibilities of the lengths of the base of the triangle. Express your final solution as a compound inequality, and explain the inequality via a short sentence.

8. Debbie is riding her horse due North, and Harold is riding his horse due South. On average, Debbie's horse travels 3 mph slower than double the speed of Harold's horse. After two hours, Debbie and Harold are 9 miles away. How fast is each horse traveling?

9. The sum of yours and your friend's score on a test is 175 points. You scored 9 points higher than your friend. What was your score on the test?

10. In a basketball game, LeBron made some 1-point, 2-point, and 3-point shots. LeBron made triple as many two-point shots as three-point shots. The number of points he earned from one-point shots was five less than double the number of three-point shots he made. LeBron earned a total of 50 points. How many of each type of shot did LeBron make?