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To prepare for the Unit 1 test, you will need to know how to...

- ✓ Classify number sets
- ✓ Identify properties
- ✓ Simplify and evaluate expressions
- ✓ Solve linear and literal equations
- ✓ Solve and graph linear inequalities in one variable
- ✓ Solve and graph compound inequalities
- ✓ Solve and graph absolute value equations and inequalities
- ✓ Find the domain and range of a relation and use interval notation to describe it
- ✓ Evaluate functions and perform simple operations
- ✓ Use transformation to graph absolute value functions

Below you will find examples of the types of problems that you may see on your test. Use this study guide along with your notes, homework, and class work to help you prepare. Good luck!

1. Given the numbers $\frac{9}{2}, \pi, -1.4, \sqrt{3}, 0, -15$

- a. Which numbers are whole numbers? \emptyset
- b. Which numbers are real numbers? *all*
- c. Which numbers are rational numbers? $\frac{9}{2}, -1.4, 0, -15$
- d. Which numbers are integers? $0, -15$

2. Identify each property illustrated.

- a. $5 + 2 = 2 + 5$ *commutative addition*
- b. $\frac{1}{12} \times 12 = 1$ *inverse multiplication*
- c. $(5 \times 9) \times 1 = (9 \times 5) \times 1$ *commutative multiplication*
- d. $9 + (-9) = 0$ *inverse addition*

3. Simplify the expression. $2(4+n) - n(5n-9) - (3n+2)$
 $-5n^2 + 8n + 6$

4. Evaluate $8x + 5y^2$ for $x = 3$ and $y = -4$.

5. Solve each literal equation for the indicated variable.

- a. $V = \frac{1}{4}h^2w$ for w $w = \frac{4V}{h^2}$
- b. $2x - 7y = 20$ for x $x = \frac{20 + 7y}{2} = 10 + \frac{7y}{2}$

6. Solve each equation. Be sure to check your solution.

- a. $4.5(x + 1) - 2 = 4(x + 3)$ *19*
- b. $\frac{3}{4}x - 2 = \frac{1}{2}x + 7$ *36*
- c. $12(x + 3) - 5x = 4x + 2$ *$-\frac{34}{3}$*
- d. $2 + |3y + 5| = 70$, *$-\frac{10}{3}$*
- e. $2|2x - 9| - 1 = -3$ *\emptyset*

7. Solve each inequality. Graph the solution on a number line.

a. $\frac{2}{3}|2x+1| > 18$ $x > 13$ or $x < -14$

b. $6|5x-2|-1 < 17$ $-1/5 < x < 1$

c. $-2 \leq 3-4x < 7$ $5/4 \geq x > -1$

d. $\frac{3}{2}x+1 < 0$ or $\frac{2}{3}x-1 > 5$ $x < -2/3$ or $x > 9$

e. $(4-x)-2 \leq 3(x-2)$ $x \geq 2$

8. If $f(x) = -5x^2 + 2x - 1$, $g(x) = 2(x-3)$, and $h(x) = \frac{x-3}{x}$, find the following:

- a. $f(-2) = -25$
- b. $g(3) = 0$
- c. $h(7) - g(-2) = \frac{74}{7}$ or $10 \frac{4}{7}$
- d. $3f(1) = -12$

9. Are the following relations functions? State why or why not. Then state the domain and range using interval notation. *where appropriate*

a. $\{(5,1), (-3,5), (8,1), (2,-7)\}$ b.

yes

D: $\{5, -3, 8, 2\}$

R: $\{1, 5, -7\}$

No

D: $[-1, 1]$

R: $(-\infty, \infty)$

10. Use transformations to sketch the graph of $y = -|x+3| + 8$. Then state the domain and range of the function using interval notation.

x	3
y	$(-1)+8$
5	6
4	7
3	8
2	7
1	6

Domain: $(-\infty, \infty)$ Range: $(-\infty, 8]$