Name: _____

1) Which one of the following equations is equivalent to 2x + 14 = -5?
A) 2x + 10 = -9 B) 2x + 14 = -10 C) x + 7 = -10 D) x = 2(-5 - 7)

2) Write a first degree equation with one variable that is true for all real numbers.
Answer: _____

3) Write a first degree equation with one variable that has the empty set as its solution set.
Answer: _____

4) Is x = 4 the solution for $4(2x + 1) = 7 + 3(2x - 5)$?
Show your work.

Circle one*: Yes No*

5) The solution to the equation $2 - 7(x - 1) = 3(x - 2) - 5(x - 3)$ is shown below. Fill in each blank with a reason for each step of the solution.

$2 - 7x + 7 = 3x - 6 - 5x + 15$ _____

$-7x + 2 + 7 = (3x - 5x) + 15 - 6$ _____

$-7x + 9 = -2x + 9$ _____

$-7x = -2x$ _____

$-5x = 0$ _____

$x = 0$ _____

6) Solve for x: $\frac{7}{10}x + 2 = 16$
Show your work.

Answer: _____

7) Solve for x: $\frac{y+2}{3} - \frac{y+3}{4} = \frac{1}{2}$
Show your work.

Answer: _____

Question 8 refers to the following:

Solve the given equation for the variable and check the solution:

8) $5(k + 1) - k = 3(k + 2)$
Show your work.

Answer: _____

---

9) What inequality is equivalent to $2x - 1 > 5$?
A) $x > 2$ B) $x > 3$ C) $x > 6$ D) $x < 3$

10) What inequality is equivalent to $\frac{3x}{2} - 6 < 9$?
A) $x < 7$ B) $x < 10$ C) $x < 8$ D) $x < 2$

Questions 11 and 12 refer to the following:

Solve the given inequality for x, and represent the solution set using set notation, interval notation, and using words:

11) $3x - 9 > 12$
Show your work.

Set notation: _____
Interval notation: _____
Words: _____

12) $3x + 7 \leq 6x - 2$
Show your work.

Set notation: _____
Interval notation: _____
Words: _____

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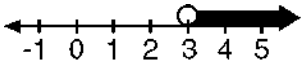
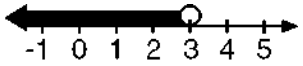
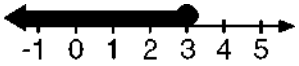
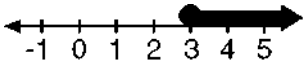
13) Which one of the following graphs represents the solution of the inequality $2x + 3 > 9$?

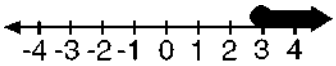
A) 

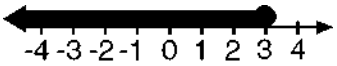
B) 

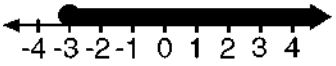
C) 

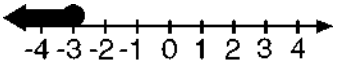
D) 

14) Which one of the following graphs represents the solution of the inequality $-3x + 1 \leq 10$?

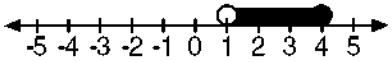
A) 

B) 

C) 

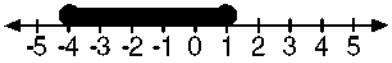
D) 

15) What interval notation represents the data graphed below?



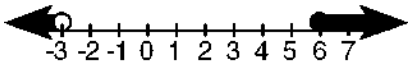
A) (1,4) B) (4,1) C) (1,4] D) [4,1)

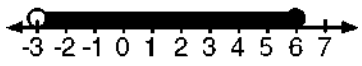
16) What interval notation represents the data graphed below?

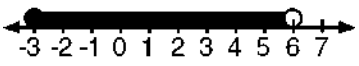


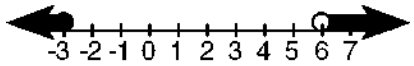
A) [-4,1) B) (-4,1] C) (-4,1) D) [-4,1]

17) Which of the graphs below shows the solution set of $(-\infty,-3] \cup (6,\infty)$?

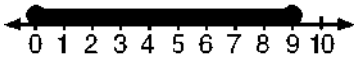
A) 

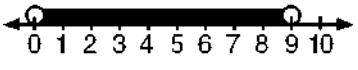
B) 

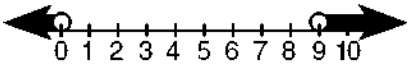
C) 

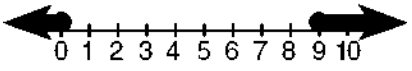
D) 

18) Which of the graphs below shows the solution set of $(-\infty,0) \cup (9,\infty)$?

A) 

B) 

C) 

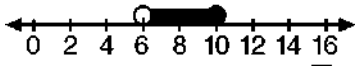
D) 

19) Write an example of a compound statement that has the set of all real numbers as its solution set.
Answer: _____

Questions 20 and 21 refer to the following:

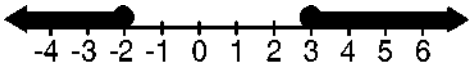
Write a compound inequality that represents the given graph:

20)



Answer: _____

21)



Answer: _____

Questions 22 and 23 refer to the following:

Solve the given inequality and represent the solution set using set notation:

22) $6 > 3(4 + 5d) > -3$
Show your work.

Answer: _____

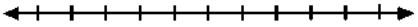
23) $3x - 1 < 2(x + 4)$ or $7x - 3 \geq 2(x + 1)$
Show your work.

Answer: _____

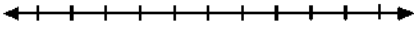
---

24) **Part A**
Solve the compound inequality $2x + 3 \geq 11$ and $3(x - 1) > 15$. Represent the solution set *both* algebraically and graphically (if possible)
Show your work.

Algebraically: _____

Graphically: 

Part B
Replace the logical connector "and" with an "or" and solve the resulting inequality. Represent the solution set both algebraically and graphically (if possible)
Algebraically: _____

Graphically: 

Part C
Write an explanation as to why the solution sets are not equivalent.

_____

_____

_____

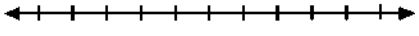
_____

Questions 25 and 26 refer to the following:

Solve the given inequality and represent the solution set using interval notation and set notation. Graph any solution set that is not empty:

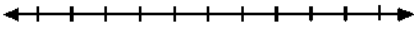
25) $-7 \geq 1 - 4x \geq 1$
Show your work.

Set notation: _____
Interval notation: _____

Graph: 

26) z - 5 > 2 or 4 + *z* < 2
Show your work.

Set notation: _____
Interval notation: _____

Graph: 

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27) What is the value of x if 5*a* - 3*x* = 2*b* + 4*x*?
A) $\frac{2b-5a}{7}$ B) $\frac{5a+2b}{7}$ C) $\frac{5a+2b}{-7}$ D) $\frac{5a-2b}{7}$

Questions 28 through 30 refer to the following:

Solve the given formula for the indicated variable:

28) T = *fm* - *gm*; *m*
Show your work.

Answer: _____

29) $F = \frac{9}{5}C + 32;\ C$
Show your work.

Answer: _____

30) $\mathrm{V} = \pi r^2 h;$ r
Show your work.

Answer: _____

Question 31 refers to the following:

Write the given equation as a compound statement that indicates restriction on the values of the variable, and solve the equation:

31) $\frac{2}{x-1} = \frac{6}{2x+1}$

Show your work.

Statement: []

Solution set: _____

---

32) Which real number property is illustrated by the expression 3(2 - x) = 6 - 3*x*?

A) Multiplicative Identity Property B) Distributive Property of Multiplication Over Subtraction

C) Multiplicative Inverse Property D) Commutative Property

33) Determine the real number property illustrated by the algebraic identity (xy)*z* = *z*(*xy*).

A) Associative Property for Multiplication B) Commutative Property for Multiplication

C) Closure Property D) Distributive Property

34) Which equation illustrates the Commutative Property of Addition?

A) 5xy + 4*z* = 4*z* + 5*xy* B) x(5*y* - *z*) = 5*xy* - *xz* C) 5x + (*y* + 4*z*) = (5*x* + *y*) + 4*z* D) 5xy + 4*z* = 5*xy* + 4*z*

35) Which equation illustrates the Associative Property of Addition?

A) (a + *b*) + (*c* - *d*) + (*e* + *f*) = (*c* - *d*) + (*e* + *f*) + (*a* + *b*) B) ((a + *b*)(*c* - *d*))(*e* + *f*) = (*a* + *b*)((*c* - *d*))(*e* + *f*))

C) ((a + *b*) + (*c* - *d*)) + (*e* + *f*) = (*a* + *b*) + ((*c* - *d*)) + (*e* + *f*)) D) (a + *b*)(*c* - *d*) = (*a* + *b*)*c* - (*a* + *b*)*d*

36) When solving the equation (5 + x)2 = 50, Marianna rewrites the equation to be 2(5 + *x*) = 50. What property of the Real Number System did Marianna use?

A) Associative Property for Multiplication B) Commutative Property for Addition

C) Commutative Property for Multiplication D) Associative Property for Addition

Questions 37 and 38 refer to the following:

Determine which number property is illustrated by the given statement:

37) $x + (y + x) = x + (x + y)$

38) $x \cdot (z \cdot x) = x \cdot (x \cdot z)$

---

39) What property of real numbers is illustrated by the statement (a - $b)(a^2 + b^2)(a + b) = (a - b)(a + b)(a^2 + b^2)$?

40) Given that a > *b*, solve for *x* in terms of *a* and *b* [*Show all work.*]: $b(x - 3) \geq ax + 7b$

41) The formula for the area of a trapezoid is A = $\frac{1}{2}h(b_1 + b_2)$.

(**a**) Express b_1 in terms of *A*, *h*, and b_2. [*Show all work.*]

(**b**) The area of a trapezoid is 60 square feet, its height is 6 ft, and one base is 12 ft. Find the number of feet in the other base. [Show all work.]

42) Which value of x is the solution of the equation $\frac{1}{7} + \frac{2x}{3} = \frac{15x-3}{21}$?

A) 6 B) $\frac{4}{13}$ C) 0 D) $\frac{6}{29}$

43) What is the solution set of the equation $\frac{x}{2} - \frac{1}{3} = \frac{2x-5}{6}$?

A) {–11} B) {–3} C) {11} D) {3}

Questions 44 through 46 refer to the following:

Solve the given equation for the variable in simplest form:

44) $\frac{w-3}{2} - \frac{w+5}{3} = -2$

A) 13 B) 7 C) –7 D) –13

45) $\frac{2s+7}{6} - \frac{2s-9}{10} = 3$

46) $\frac{3z-4}{3} - \frac{5z-1}{9} = \frac{2z+4}{6}$
