Name: _____

Questions 1 through 4 refer to the following:

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

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

Answer: _____

2) $6 > 3(4 + 5d) > -3$
Show your work.

Answer: _____

3) $3(x - 1) < 4x < 3x - 1$
Show your work.

Answer: _____

4) $3(w - 2) < 4w - 5 < 3(w - 1)$
Show your work.

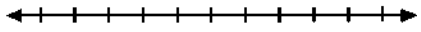
Answer: _____

Questions 5 and 6 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:

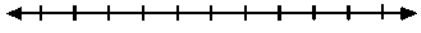
5) $-3 \leq 5 + x < 1$
Show your work.

Set notation: _____
Interval notation: _____

Graph: 

6) $-4 < 4(x - 1) \leq 12$
Show your work.

Set notation: _____
Interval notation: _____

Graph: 

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

Circle one: ***Yes No***

8) The solution to the equation 14 = 15x - (2*x* + 12) is shown below. Fill in each blank with a reason for each step of the solution.

14 = 15*x* – 2*x* – 12 _____

14 = 13*x* – 12 _____

26 = 13*x* _____

2 = *x* _____

9) Solve for x: $\frac{7}{10}x + 2 = 16$

Show your work.

Answer: _____

10) Solve for x: $\frac{x}{3} + \frac{x}{2} = 5$

Show your work.

Answer: _____

11) Solve for a: $\frac{a}{3} + \frac{5a}{12} = \frac{9}{4}$

Show your work.

Answer: _____

12) Solve for x: $\frac{y+2}{3} - \frac{y+3}{4} = \frac{1}{2}$

Show your work.

Answer: _____

13) What statement is equivalent to the inequality 9 - 4x ≤ 3*x* - 5?

A) x ≥ 2 B) x < 2 C) x > -2 D) x ≤ -2

Questions 14 and 15 refer to the following:

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

14) 4 - 3x < -5

Show your work.

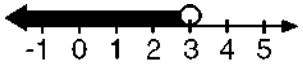
Set notation: _____
Interval notation: _____
Words: _____

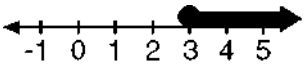
15) 5x + 4 > 19

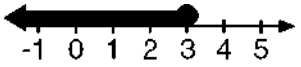
Show your work.

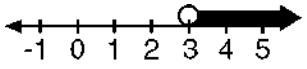
Set notation: _____
Interval notation: _____
Words: _____

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

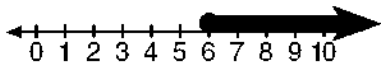
A) 

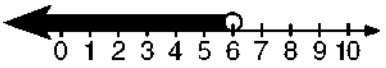
B) 

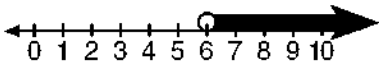
C) 

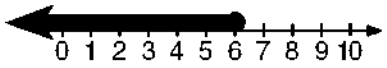
D) 

17) Which of the following is the graph of the solution set for $-3x + 16 \geq -2$?

A) 

B) 

C) 

D) 

18) What is the value of x if $5a - 3x = 2b + 4x$?

A) $\frac{2b-5a}{7}$ B) $\frac{5a-2b}{7}$ C) $\frac{5a+2b}{-7}$ D) $\frac{5a+2b}{7}$

19) Solve $4bx - 5 = 5c$ for x.

A) $\frac{5c+5}{4b}$ B) $\frac{5-5c}{4b}$ C) $\frac{5c+5}{-4b}$ D) $\frac{5c-5}{4b}$

20) If $2ax - 5x = 2$, then x is equivalent to

A) $\frac{1}{a-5}$ B) $\frac{2}{2a-5}$ C) 7 - 2a D) $\frac{2+5a}{2a}$

21) The formula for the volume of a right circular cylinder is $V = \pi r^2 h$. The value of h can be expressed as

A) $\frac{V}{\pi} r^2$ B) $V - \pi r^2$ C) $\frac{V}{\pi r^2}$ D) $\frac{\pi r^2}{V}$

Question 22 refers to the following:

Solve the given formula for the indicated variable:

22) $T = fm - gm$; m

Show your work.

Answer: _____

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

A) Multiplicative Identity Property

B) Commutative Property

C) Distributive Property of Multiplication Over Subtraction

D) Multiplicative Inverse Property

24) Which property is illustrated by the equation $(x + y) + z = z + (x + y)$?

A) Closure Property

B) Associative Property for Addition

C) Commutative Property for Addition

D) Distributive Property

25) Which property is illustrated by the equation $(x + y) + z = x + (y + z)$?

A) Commutative Property for Addition

B) Symmetric Property of Equality

C) Distributive Property

D) Associative Property for Addition

26) Determine the real number property illustrated by the algebraic identity $(xy)z = x(yz)$.

A) Reflexive Property of Equality

B) Commutative Property for Multiplication

C) Associative Property for Multiplication

D) Distributive Property

Question 27 refers to the following:

Determine which number property is illustrated by the given statement:

27) $5 \times (9 \times 2) = 5 \times (2 \times 9)$

A) Commutative Property of Multiplication

B) Property of Multiplicative Inverse

C) Distributive Property

D) Associative Property of Multiplication

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28) When solving the equation $(10 + x) + 3x = 50$, Terri rewrites the equation to be $10 + (x + 3x) = 50$. What property of the Real Number System did Terri use?

A) Commutative Property for Multiplication

B) Commutative Property for Addition

C) Associative Property for Multiplication

D) Associative Property for Addition

29) Is the set of natural numbers a closed set under addition? [Explain why or why not.]

_____

_____

_____

30) Is the set of natural numbers a closed set under division? [Explain why or why not.]

_____

_____

_____

31) Is the set of natural numbers a closed set under subtraction? [Explain why or why not.]

_____

_____

_____

32) Is the set of integers a closed set under multiplication? [Explain why or why not.]

_____

_____

_____

33) Is the set of integers (excluding 0) a closed set under division? [Explain why or why not.]

_____

_____

_____

34) $6 + (-6) = 0$ illustrates what property of real numbers?

Answer: _____

35) $3 \bullet \frac{1}{3} = 1$ illustrates what property of real numbers?

Answer: _____

36) What is the value of x in the equation $\frac{3}{4}x + 2 = \frac{5}{4}x - 6$?

A) 16 B) 4 C) –4 D) –16

Question 37 refers to the following:

Solve the given equation for the variable in simplest form:

37) $\frac{2y+7}{4} - \frac{3y-7}{5} = y$

A) $\frac{3}{7}$ B) $\frac{63}{22}$ C) $\frac{7}{22}$ D) $\frac{22}{63}$

---

38) Write a definition for an irrational number.

39) $\frac{5}{8}$ is a(n)

A) irrational number B) rational number

C) natural number D) integer

40) Which of the following is rational and has a terminating decimal?
A) $\frac{1}{3}$ B) π C) $\frac{3}{4}$ D) $\sqrt{7}$

41) Which of the following is an irrational number?
A) $\frac{1}{4}$ B) $\sqrt{8}$ C) $\sqrt{9}$ D) $\frac{1}{3}$

42) Which of the following are rational numbers?
$3.14, \pi, -7, 8, \frac{1}{3}$

43) Which of the following are irrational numbers?
$-\sqrt{7}, -2, -\frac{1}{3}, \pi$

Questions 44 and 45 refer to the following:

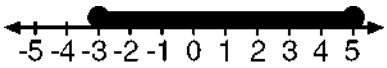
Determine whether the given statement is true or false.

44) Zero is a rational number. True or False?
A) True B) False

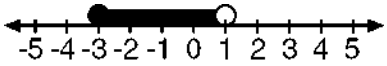
45) $\sqrt{19}$ is an irrational number. True or False?
A) True B) False

Questions 46 through 49 refer to the following:

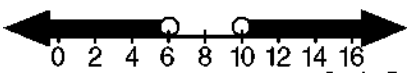
Write a compound inequality that represents the given graph:

46) 

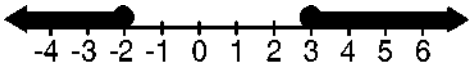
Answer: _____

47) 

Answer: _____

48) 

Answer: _____

49) 

Answer: _____