1 Is the equation $3(2x-4)=-18$ equivalent to $6x-12=-18$?

A   Yes, the equations are equivalent by the Associative Property of Multiplication.

B   Yes, the equations are equivalent by the Commutative Property of Multiplication.

C   Yes, the equations are equivalent by the Distributive Property of Multiplication over Addition.

D   No, the equations are not equivalent.

2 Which statement is false?

A   The order in which two whole numbers are subtracted does not affect the difference.

B   The order in which two whole numbers are added does not affect the sum.

C   The order in which two rational numbers are subtracted does not affect the difference.

D   The order in which two rational numbers are multiplied does not affect the product.

3 $$\sqrt{16} + \sqrt[3]{8} =$$

A   4

B   6

C   9

D   10

4 Which expression is equivalent to $x^6 x^2$?

A $x^4 x^3$

B $x^5 x^3$

C $x^7 x^3$

D $x^9 x^3$

5 Which number does *not* have a reciprocal?

A -1

B 0

C $\dfrac{1}{1000}$

D 3

6 What is the multiplicative inverse of $\dfrac{1}{2}$?

A -2

B $-\dfrac{1}{2}$

C $\dfrac{1}{2}$

D 2

7 What is the solution for this equation?
$$|2x - 3| = 5$$

A $x = -4 \ or \ x = 4$

B $x = -4 \ or \ x = 3$

C $x = -1 \ or \ x = 4$

D $x = -1 \ or \ x = 3$

8 What is the solution set of this inequality?
$$5 - |x + 4| \leq -3$$

A $-2 \leq x \leq 6$

B $x \leq -2 \ or \ x \geq 6$

C $-12 \leq x \leq 4$

D $x \leq -12 \ or \ x \geq 4$

9 Which equation is equivalent to
$$5x - 2(7x + 1) = 14x \ ?$$

A $-9x - 2 = 14x$

B $-9x + 1 = 14x$

C $-9x + 2 = 14x$

D $12x - 1 = 14x$

10 Which equation is equivalent to
$$4(2 - 5x) = 6 - 3(1 - 3x) \ ?$$

A $8x = 5$

B $8x = 17$

C $29x = 5$

D $29x = 17$

11 Which equation is equivalent to
$$3[7x - 4(x - 3)] + 1 = 16$$

A $9x - 2 = 16$

B $9x + 37 = 16$

C $17x - 2 = 16$

D $17x + 13 = 16$

12 The total cost (c) in dollars of renting a sailboat for n days is given by the equation
$$c = 120 + 60n$$

If the total cost was \$360, for how many days was the sailboat rented?

A   2

B   4

C   6

D   8

13   Solve: $3(x + 5) = 2x + 35$

Step 1: $3x + 15 = 2x + 35$
Step 2: $5x + 15 = 35$
Step 3: $5x = 20$
Step 4: $x = 4$

Which is the first *incorrect* step in the solution shown above?

A   Step 1

B   Step 2

C   Step 3

D   Step 4

14 A 120-foot-long rope is cut into 3 pieces. The first piece of rope is twice as long as the second piece of rope. The third piece of rope is three times longer than the second piece of rope. What is the length of the longest piece of rope?

   A   20 feet

   B   40 feet

   C   60 feet

   D   80 feet

15 The cost to rent a construction crane is $750 Per day plus $250 per hour of use. What is the maximum number of hours the crane can be used each day if the rental cost is not to exceed $2500 per day?

   A   2.5

   B   3.7

   C   7.0

   D   13.0

16 What is the solution to the inequality
$$x - 5 > 14 ?$$

   A $x > 9$

   B $x > 19$

   C $x < 9$

   D $x < 19$

17 The lengths of the sides of a triangle are y, $y+1$ and 7 centimeters. If the perimeter is 56 centimeters, what is the value of y?

   A   24

   B   25

   C   31

   D   32

18 Beth is two years older than Julio. Gerald is twice as old as Beth, Debra is twice as old as Gerald. The sum of their ages is 38. How old is Beth.

   A   3

   B   5

   C   6

   D   8

19 Which number serves as a counter example to the statement below?

| All positive integers are divisible by 2 or 3. |

A 100

B 57

C 30

D 25

20 What is the conclusion of the statement in the box below?

| If $x^2 = 4$, then $x = -2$ or $x = 2$. |

A $x^2 = 4$

B $x = -2$

C $x = 2$

D $x = -2$ or $x = 2$

21 Which of the following is a valid conclusion to the statement "If a student is a high school band member, then the student is a good musician"?

A All good musicians are high school band members.

B A student is a high school band member.

C All students are good musicians.

D All high school band members are good musicians.

22 The chart below shows an expression evaluated for four different values of x.

x	$x^2 + x + 5$
1	7
2	11
6	47
7	61

Josiah concluded that for all positive values of x, $x^2 + x + 5$ produces a prime number. Give a value of x which serves as a counter example to prove Josiah' conclusion false.

A 5

B 11

C 16

D 21

23 John's solution to an equation is shown below.

Given: $x^2 + 5x + 6 = 0$

Step 1: $(x+2)(x+3) = 0$

Step 2: $x+2 = 0$ *or* $x+3 = 0$

Step 3: $x = -2$ *or* $x = -3$

Which property of real numbers did John use for Step 2?

A multipication property of equality

B zero product property of multiplication

C communitive property of multiplication

D distributive property of multiplication over addition

24 Stan's solution to an equation is shown below.

Given: $n + 8(n + 20) = 110$

Step 1: $n + 8n + 20 = 110$

Step 2: $9n + 20 = 110$

Step 3: $9n = 110 - 20$

Step 4: $9n = 90$

Step 5: $\dfrac{9n}{9} = \dfrac{90}{9}$

Step 6: $n = 10$

Which statement about Stan's solution is true?

A   Stan's solution is correct.

B   Stan made a mistake in Step 1.

C   Stan made a mistake in Step 3.

D   Stan made a mistake in Step 5.

25 When is this statement true?

The opposite of a number is less than the original number.

A   This statement is never true.

B   This statement is always true.

C   This statement is true for positive numbers.

D   This statement is true for negative numbers.