Unit 1 Test: Foundations of Algebra

1) Answer each part of problem 1.
The absolute value of twice a number n and three is greater than or equal to six.

A) Write the sentence above using symbols.

B) Solve the inequality you wrote in part A. Show all your work.
Justify each step with the algebraic properties.

C) Aubrey solved an inequality with the following solution: $-\frac{8}{3} < x < \frac{16}{3}$
Graph the solution set.

D) Aubrey realizes that x represents the number of cars needed to transport all of her friends to the charity race they are attending. What is the solution now?
What classification of numbers represents the correct solution? Explain.

CONTINUE

_____ **2)** Given $9k - 2 = 3k - 8$, what is the value of k?

A) $-\frac{5}{3}$ **B)** -1

C) $\frac{1}{2}$ **D)** 1

_____ **3)** Choose the statement that is *incorrect*.

A) *All* rational numbers are real.

B) The sum of two rational numbers is *always rational*.

C) The sum of a rational number and an irrational number is *always rational*.

D) *All* irrational numbers are real.

_____ **4)** Determine the solution(s) to the equation: $-4x + 6(x - 1) = -7x + 9(x + 1) - 15$

A) $x = 0$

B) $x = 2$

C) no solution

D) all real numbers

_____ **5)** Brandon was solving the equation $2x - 3 = 6x + 5$.
What step would *not* help him solve for x?

A) Add -5 to both expressions by the Addition Property of Equality.

B) Add $2x$ to both expressions by the Addition Property of Equality.

C) Add $-2x$ to both expressions by the Addition Property of Equality.

D) Multiply both expressions by $\frac{1}{4}$ by the Multiplication Property of Equality.

_____ **6)** A plane was traveling at 512 miles per hour.
Which of the following is an expression of the conversion to feet per second?

A) $\frac{(512)(5{,}280)}{(60)(60)}$ **B)** $\frac{(60)(60)}{(512)(5{,}280)}$

C) $\frac{(512)(60)}{(5{,}280)(60)}$ **D)** $\frac{(512)(60)(60)}{(5{,}280)}$

_____ **7)** How many solutions are there for the equation $|3 - m| = 7.25$?

A) 0

B) 1

C) 2

D) all real numbers

CONTINUE

_____ **8)** Select the answer that shows the equation $2x + 4y = C$ in terms of y.

A) $y = \frac{C}{4} - 2x$

B) $y = \frac{C}{4} + 2x$

C) $y = \frac{C}{4} - \frac{1}{2}x$

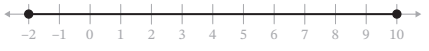
D) $y = \frac{C}{4} + \frac{1}{2}x$

_____ **9)** Select the graph for $|x - 4| < 6$.

A)

B)

C)



D)

_____ **10)** The sum of three consecutive odd integers is −57.
Write and solve for the integers that make this statement true.

A) $(x) + (x + 2) + (x + 4) = -57, \{-17, -19, -21\}$

B) $(x) + (x + 1) + (x + 2) = -57, \{-18, -19, -20\}$

C) $(x) + (2x) + (4x) = -57, \{-17, -18, -21\}$

D) $(x) + (x) + (x) = -57, \{-19\}$

_____ **11)** What is the interquartile range (IQR) for the data set $\{23, 21, 20, 19, 25, 27, 19\}$?

A) 22

B) 21

C) 8

D) 6

_____ **12)** Select the graph for $-\frac{1}{2}p - 3 > 5$.

A)

B)

C)

D)

_____ **13)** Given the expression $\frac{4b^2}{n}$; n represents an irrational number and b represents a rational number. Which of the following is true?

A) The expression is rational.

B) The expression is irrational.

C) The expression is not a real number.

D) It cannot be determined.

CONTINUE

_____ **14)** A gallon of orange juice must be within 1 fluid ounce to be sold at The Gene's Juices. Write an absolute value inequality to represent the acceptable range in ounces for which the orange juice can be sold.

A) $|n - 1| \leq 1$

B) $|n - 1| \leq 128$

C) $|n - 128| \leq 1$

D) $|n - 128| \geq 1$

_____ **15)** Given the statement $|b - 7| = 2p - 4$ has at least one solution, what *cannot* be true about the value of p?

A) $p \geq 2$

B) $p < 2$

C) $p = 5$

D) $p = 2$

_____ **16)** Maria can spend no more than \$15.50 downloading music. The initial cost for the upgraded app is \$3.50 and each song costs \$1.50. Write an inequality that shows the maximum number of songs Maria can download. Let s represent the number of songs.

A) $1.50 + 3.50s \geq 15.50$

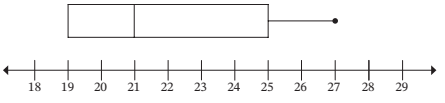
B) $1.50s + 3.50 \leq 15.50$

C) $1.50 + 3.50s > 15.50$

D) $1.50s + 3.50s < 15.50$

_____ **17)** Represent the following data with a box plot: $\{23, 21, 20, 19, 25, 27, 19\}$.

A)



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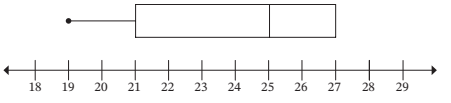

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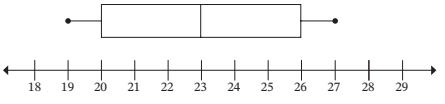

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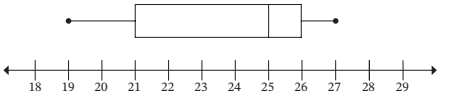


_____ **18)** Rewrite the equation $\frac{2}{3} - \frac{1}{6}x = \frac{3}{4}(x + 2)$ using only integers.

A) $2 - x = 3(x + 2)$

B) $24 - 12x = 36(x + 2)$

C) $8 - 2x = 9(12x + 24)$

D) $8 - 2x = 9(x + 2)$

CONTINUE

_____ **19)** The summer orchestra had a ratio of 2:5 for wind instruments to string instruments. There were n string players and $n - 3$ wind instrument players. Write a proportion to represent the given information.

A) $\frac{n-3}{n} = \frac{2}{5}$

B) $\frac{n}{n-3} - 3 = \frac{2}{5}$

C) $n - 3 = 5$

D) $\frac{n-3}{n} = \frac{5}{2}$

_____ **20)** Select the graph for $7x - 4 \leq 10$ *or* $-\frac{x}{3} < -2$

A)

B)

C)

D)

_____ **21)** Dana is making 12 batches of breakfast muffins. Rather than measuring out 48 teaspoons of vanilla extract, Dana wants to know the conversion to cup(s). (16 Tbsp = 1 cup)

A) 16 cups

B) 4 cups

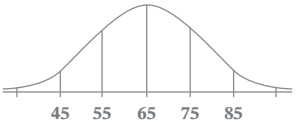
C) 1 cup

D) $\frac{1}{2}$ cup

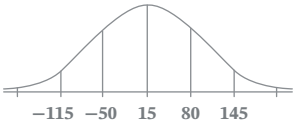
_____ **22)** The standard deviation for a given set of data is 15. The mean of the data is 65. Which graph represents the appropriate bell curve?

A)

B)



C)



D)

_____ **23)** Select all of the following equations that have a solution of $x = 6$.

☐ $-|2x| = 12$

☐ $\frac{x-3}{x} = \frac{1}{2}$

☐ $\frac{2}{3}(12 - x) = x - 2$

☐ $|x - 6| = 0$

CONTINUE

_____ **24)** Select any number that would be an outlier for the data set. $\{21, 26, 28, 33, 35, 36, 42, 52\}$

- ☐ 12
- ☐ 15
- ☐ 54
- ☐ 60

_____ **25)** Select any solution(s) the equation and inequality have in common.

Equation: $|2x - 4| = 6$ Inequality: $|2x - 4| \leq 6$

- ☐ -5
- ☐ -1
- ☐ 0
- ☐ 5

STOP