Grade 7 Math June 16

Post Test - Math

Question 1 .

What is the distance of the red line segment on the number line?

A. 1

B. $1\frac{1}{2}$

C. $1\frac{1}{4}$

D. $2\frac{1}{2}$

Question 2 .

A right rectangular prism has a length of 6 inches, a width of 7 inches, and a height of 8 inches. If a plane slices the prism in half, parallel to its smallest face, which of the following describes the shape of the two-dimensional cross-section?

A. a 6-inch by 7-inch rectangle

B. a 7-inch by 7-inch square

C. a 6-inch by 8-inch square

D. a 7-inch by 8-inch rectangle

Question 3 .

Which of the following is equivalent to $\frac{-7}{-12}$?

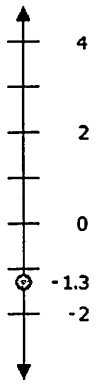
A. $\frac{-7}{12}$

B. $\frac{7}{12}$

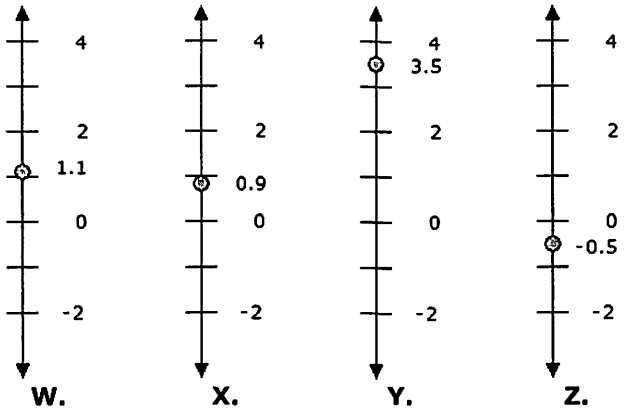
C. $\frac{7}{-12}$

D. $\frac{12}{7}$

Question 4 .



Which of the following number lines shows the sum of the number above and 2.2?



A. W

B. Z

C. X

D. Y

Question 5 .

Samuel's Middle School had a Week of Giving charity drive. The table below shows the number of participants per day.

Day	Number of Participants
1	75
2	96
3	117
4	138
5	159

What is the constant of proportionality, or unit rate, for the increase in the number of participants?

A. 21 people per day

B. 48 people per day

C. 31.8 people per day

D. 10 people per day

Question 6 .

Mary bought 17 bags of onions. Each bag contained 9 onions. If each onion costs $1.16 including tax, what was the total cost of the onions?

A. $177.48

B. $162.18

C. $30.16

D. $182.68

Question 7 .

A fair six-sided die is rolled 54 times. Theoretically, about how many times should a roll of "5" occur?

A. 9

B. 5

C. There is no way to tell.

D. 14

Question 8 .

Select the expression below that is equal to $7(9 - m)$.

A. $63 - 7m$

B. $16 - m$

C. $63 - m$

D. $7m - 63$

Question 9 .

Carrie is asked to draw a triangle with the following specification:

- at least two angles measuring 60°

Which of the following statements about this triangle is true?

A. More than one triangle exists with the given condition, and all instances must be isosceles triangles.

B. More than one triangle exists with the given condition, and all instances must be equilateral triangles.

C. Exactly one triangle exists with the given condition, and it must be an isosceles triangle.

D. Exactly one triangle exists with the given condition, and it must be an equilateral triangle.

Question 10 .

Becky bought a magazine for $3.29, and the sales tax was 8.25%. How much sales tax did Becky pay on the magazine?

A. $0.27

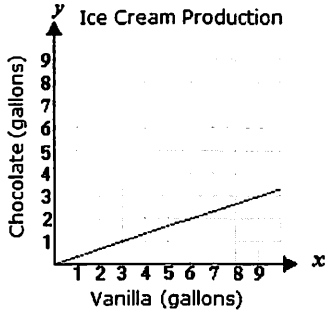
B. $0.24

C. $0.28

D. $0.25

Question 11 .

The proportional relationship between the number of gallons of chocolate ice cream and the number of gallons of vanilla ice cream that an ice creamery freezes daily is graphed below.



What does the point (6, 2) represent on the graph?

A. There are always 6 – 2 = 4 more gallons of vanilla ice cream frozen than chocolate ice cream frozen.

B. For every 6 gallons of chocolate ice cream frozen, the ice creamery freezes 2 gallons of vanilla ice cream.

C. There are 6 times the number of gallons of vanilla ice cream frozen than chocolate ice cream.

D. For every 6 gallons of vanilla ice cream frozen, the ice creamery freezes 2 gallons of chocolate ice cream.

Question 12 .

Simplify the following expression:

29 + (-37)

A. 8

B. -8

C. 2

D. 66

Question 13 .

An architect drew the blueprint for a new office building. He used a scale in which 1 inch represents 7.5 feet. The floor of an office in the building will have actual dimensions of 18 feet by 25 feet. What will be the approximate dimensions on the blueprint?

A. 2.4 inches by 3.33 inches

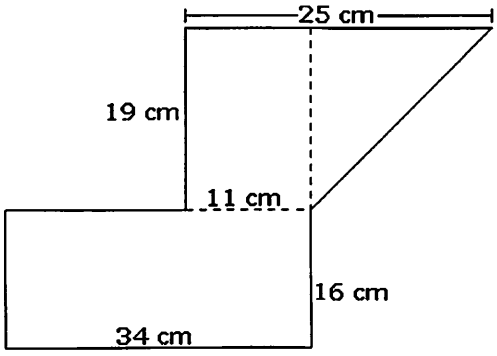
B. 25.5 inches by 32.5 inches

C. 10.5 inches by 17.5 inches

D. 135 inches by 187.5 inches

Question 14 .

What is the area of the shape below?



Note: Figure not drawn to scale

A. 1,019 cm^2

B. 990.5 cm^2

C. 781.5 cm^2

D. 886 cm^2

Question 15 .

What is the area of a circle with a radius of 7 inches? Use $\pi = 3.14$.

A. 153.86 square inches

B. 21.98 square inches

C. 43.96 square inches

D. 615.44 square inches

Question 16 .

The probability of Mrs. Galvan randomly selecting a black pen from the 20 pens in her drawer is $\frac{3}{20}$. Which of the following describes the likelihood of selecting a black pen?

A. likely

B. neither unlikely nor likely

C. unlikely

Question 17 .

Tyrone has 41 movies in his collection. He wants to estimate the average length, in minutes, per movie in his collection. So, he wrote down the length of 10 random movies. The lengths are listed below.

101, 130, 143, 94, 143, 101, 130, 101, 143, 94

Assuming that the sample was representative of the entire collection, what was the mean number of minutes per movie?

A. 97.5

B. 122

C. 118

D. 136.5

Question 18 .

Which of the following is an example of random sampling?

A. Migrant workers are surveyed on their opinion of mandatory health insurance for companies.

B. A national survey company picks one phone number from each area code in America to call and ask for an opinion on current political issues.

C. The manager of a restaurant asks customers their opinion on a new salad dressing.

D. The school newspaper asks teachers in that middle school how they feel about the behavior of twelve year old boys.

Question 19 .

In a pizza eating contest, Darren ate $\frac{1}{3}$ of an 18-inch pizza in $\frac{5}{6}$ of a minute.

What would be his unit rate of pizzas per minute eaten?

A. $\frac{2}{5}$

B. $\frac{2}{3}$

C. $\frac{7}{6}$

D. $\frac{5}{18}$

Question 20 .

Helen determined she walks about 1,800 steps per $\frac{4}{5}$ of a mile. How many steps did she take if she walked 6 miles?

- **A.** 8,640
- **B.** 6,750
- **C.** 13,500
- **D.** 10,800

Answers

1. B
2. A
3. B
4. C
5. A
6. A
7. A
8. A
9. B
10. A
11. D
12. B
13. A
14. D
15. A
16. C
17. C
18. B
19. A
20. C

Properties of Multiplication and Division

Question 1 .

Directions: Select ALL the correct answers.

Frederick purchased a large amount of candy for a school event. After the event, $\frac{3}{4}$ of the candy was left over. Frederick put $\frac{5}{6}$ of the left over candy in the faculty break room, and then he took the rest of it home.

Select the expressions that could be used to determine what fraction of the original candy Frederick took home.

$\frac{3}{4} \times \left(\frac{5}{6} - 1\right)$

$\frac{3}{4} \times \left(1 - \frac{5}{6}\right)$

$\left(\frac{3}{4} \times \frac{5}{6}\right) + \left(\frac{3}{4} \times (-1)\right)$

$\left(\frac{3}{4} \times 1\right) + \left(\frac{3}{4} \times \left(-\frac{5}{6}\right)\right)$

$\left(\frac{3}{4} \times 1\right) - \left(\frac{3}{4} \times \left(-\frac{5}{6}\right)\right)$

$\left(\frac{3}{4} \times \frac{5}{6}\right) - \left(\frac{3}{4} \times (-1)\right)$

Question 2 .

Directions: Drag each expression to the correct location on the table.

Determine whether each expression is positive, negative, or undefined.

$-\left(\frac{-12}{-13}\right)$ $\frac{-1+5}{3-3}$ $\frac{5-9}{4-1}$ $\frac{3-2}{-5}$ $-\left(\frac{20}{5+-4-1}\right)$ $\frac{-4+2}{-1}$

Question 3 .

Directions: Type the correct answer in the box. Use numerals instead of words.

Olivia is filling treat bags with candy. She has a total of $3\frac{1}{2}$ pounds of candy and wants to put 0.25 of a pound into each bag.

Use this information to complete the following statement.

Olivia has enough candy to completely fill ⌜ ⌝ bags.

Question 4 .

Directions: Drag the tiles to the correct boxes to complete the pairs.

Match each situation with the appropriate expression.

$\frac{1}{3}\left(\frac{3}{5}+\frac{2}{5}\right)$ $\frac{2}{5}\left(\frac{3}{5}+\frac{1}{3}\right)$ $\frac{3}{5}\left(\frac{1}{3}+\frac{2}{5}\right)$ $\frac{2}{5}\left(\frac{3}{5}\div\frac{1}{3}\right)$ $\frac{3}{5}\left(\frac{1}{3}-\frac{2}{5}\right)$ $\frac{1}{3}\left(\frac{3}{5}\times\frac{2}{5}\right)$

Jeremy planted $\frac{1}{3}$ of his garden with potatoes and the remaining with carrots. Of the amount planted with potatoes, $\frac{3}{5}$ was planted with russet potatoes and $\frac{2}{5}$ was planted with red potatoes. Jeremy wants to know how much of his garden is red and russet potatoes. ⟷

Kailey had $\frac{3}{5}$ gallons of lemonade to sell. She sold $\frac{1}{3}$ to her brother and $\frac{2}{5}$ to her friend. Kailey wants to know how many gallons of lemonade she sold. ⟷

Sylvia bought $\frac{2}{5}$ pounds of chocolate candies. Sylvia gave $\frac{3}{5}$ of the candies to Brendan, and $\frac{1}{3}$ of the candies to Chandra. Sylvia wants to know how many pounds of candies she gave to her friends. ⟷

Question 5 .

Directions: Select ALL the correct answers.

Select all the expressions that are equivalent to the given expression.

$$-8 \cdot 7 \div 2 \cdot (-5)$$

$-8 \cdot (7 \div 2) \cdot (-5)$

$(-8 \cdot 7 \div 2) \cdot (-5)$

$(-8 \cdot 7) \div 2 \cdot (-5)$

$-8 \cdot 7 \div (2 \cdot (-5))$

$-8 \cdot (7 \div 2 \cdot (-5))$

$(-8 \cdot 7) \div (2 \cdot (-5))$

Question 6 .

Use properties of rational numbers to multiply the following.

$$\frac{3}{13} \times 143$$

A. 103

B. 90

C. 26

D. 33

Answers

1. --
2. --
3. --
4. --
5. --
6. D

Explanations

1. The amount of left over candy was $\frac{3}{4}$ of the original amount.

After the school event, Frederick put $\frac{5}{6}$ of the left over candy in the faculty break room. This means he took home $1 - \frac{5}{6}$ of the left over candy.

To determine what fraction of the original candy Frederick took home, multiply $\frac{3}{4}$ and $1 - \frac{5}{6}$, as follows.

$$\frac{3}{4} \times \left(1 - \frac{5}{6}\right)$$

Then, use the distributive property to write an equivalent expression.

$$\left(\frac{3}{4} \times 1\right) + \left(\frac{3}{4} \times \left(-\frac{5}{6}\right)\right)$$

2. Simplify each expression to determine if it is positive, negative, or undefined. When a divisor is equal to zero, the expression is undefined.

$$\frac{-4 + 2}{-1} = \frac{-2}{-1} = \frac{2}{1} = 2$$

So, the expression above is positive.

$$\frac{3 - 2}{-5} = \frac{1}{-5} = -\frac{1}{5}$$

$$\frac{5 - 9}{4 - 1} = \frac{-4}{3} = -\frac{4}{3}$$

$$-\left(\frac{-12}{-13}\right) = -\frac{12}{13}$$

So, the expressions above are negative.

$$\frac{-1 + 5}{3 - 3} = \frac{4}{0}$$

$$-\left(\frac{20}{5 + -4 - 1}\right) = -\frac{20}{0}$$

So, the expressions above are undefined.

3. Olivia is splitting her supply of candy into equal-sized portions, so this problem is best answered using division. She has a total of $3\frac{1}{2}$ pounds of candy, and the portion of candy going into each bag will be of 0.25 of a pound. The expression that represents this problem is the following.

$$3\frac{1}{2} \div 0.25$$

Rewrite 0.25 as a fraction and divide.

$$\begin{aligned} 3\frac{1}{2} \div 0.25 &= 3\frac{1}{2} \div \frac{1}{4} \\ &= 3\frac{1}{2} \times \frac{4}{1} \\ &= \frac{7}{2} \times \frac{4}{1} \\ &= \frac{28}{2} \\ &= 14 \end{aligned}$$

So, Olivia has enough candy to completely fill 14 bags.

4. For "Jeremy planted $\frac{1}{3}$ of his garden with potatoes and the remaining with carrots. Of the amount planted with potatoes, $\frac{3}{5}$ was planted with russet potatoes and $\frac{2}{5}$ was planted with red potatoes. Jeremy wants to know how much of his garden is red and russet potatoes."
First, find the sum of red and russet potatoes. The expression for this sum is shown.

$$\frac{3}{5} + \frac{2}{5}$$

If $\frac{1}{3}$ of Jeremy's garden is potatoes, multiply the sum by $\frac{1}{3}$ to get the total amount of red and russet potatoes in his garden.

$$\frac{1}{3}\left(\frac{3}{5} + \frac{2}{5}\right)$$

For "Kailey had $\frac{3}{5}$ gallons of lemonade to sell for the fundraiser. She sold $\frac{1}{3}$ of the lemonade to her brother and sold $\frac{2}{5}$ of the lemonade to her friend. Kailey wants to know how many gallons of lemonade she sold."
First, find the sum of what she sold. The expression for this sum is shown.

$$\frac{1}{3} + \frac{2}{5}$$

If she started with $\frac{3}{5}$ gallons of lemonade and sold $\frac{1}{3} + \frac{2}{5}$ of that amount, multiply the sum by $\frac{3}{5}$ to find how many gallons of lemonade she sold.

$$\frac{3}{5}\left(\frac{1}{3} + \frac{2}{5}\right)$$

For "Sylvia bought $\frac{2}{5}$ pounds of chocolate candies for her, Brendan, and Chandra to bring on a trip. Sylvia gave $\frac{3}{5}$ of the chocolate candies to Brendan, and gave $\frac{1}{3}$ of her chocolate candies to Chandra. Sylvia wants to know how many pounds of candies she gave to her friends."
First, find the sum of what she gave to her friends. The expression for this sum is shown.

$$\frac{3}{5} + \frac{1}{3}$$

If she started with $\frac{2}{5}$ pounds of chocolate candies and gave $\frac{3}{5} + \frac{1}{3}$ of that amount, multiply the sum by $\frac{2}{5}$ to find how many pounds of chocolate candies she gave to her friends.

$$\frac{2}{5}\left(\frac{3}{5} + \frac{1}{3}\right)$$

5. First, evaluate the following expression by multiplying or dividing from left to right.

$$-8 \cdot 7 \div 2 \cdot (-5) = 140$$

Now, notice that each of the following expressions has parentheses added to the original expression. Evaluate each expression by simplifying within the parentheses first. Then, determine which expressions are equivalent to the original expression.

$$(-8 \cdot 7) \div 2 \cdot (-5) = (-56) \div 2 \cdot (-5) = 140$$

$$-8 \cdot (7 \div 2) \cdot (-5) = -8 \cdot (3.5) \cdot (-5) = 140$$

$$(-8 \cdot 7 \div 2) \cdot (-5) = (-28) \cdot (-5) = 140$$

$$-8 \cdot (7 \div 2 \cdot (-5)) = -8 \cdot (-17.5) = 140$$

$$-8 \cdot 7 \div (2 \cdot (-5)) = -8 \cdot 7 \div (-10) = 5.6$$

$$(-8 \cdot 7) \div (2 \cdot (-5)) = (-56) \div (-10) = 5.6$$

The associative property of multiplication states that numbers can be multiplied no matter how the numbers are grouped. However, the associative property does not apply to division. Therefore, the value of the expression changes whenever parentheses are used to regroup a portion of the division which alters the left to right progression of dividing 7 by 2.
So, the following expressions are equivalent to $-8 \cdot 7 \div 2 \cdot (-5)$.

$$(-8 \cdot 7) \div 2 \cdot (-5)$$

$$-8 \cdot (7 \div 2) \cdot (-5)$$

$$(-8 \cdot 7 \div 2) \cdot (-5)$$

$$-8 \cdot (7 \div 2 \cdot (-5))$$

6. Write 143 as 130 + 13. Then, use the distributive property and simplify.

$$\begin{aligned}\frac{3}{13} \times 143 &= \frac{3}{13} \times (130 + 13) \\ &= \left(\frac{3}{13} \times 130\right) + \left(\frac{3}{13} \times 13\right) \\ &= (3 \times 10) + (3 \times 1) \\ &= 30 + 3 \\ &= 33\end{aligned}$$

Properties of Addition and Subtraction

Question 1 .

Directions: Select the correct location on the number line.

Tristan just had a baby brother named Trey. Trey's feet are $\frac{1}{5}$ of a foot long. Tristan's feet are $\frac{3}{5}$ of a foot longer than Trey's. How long are Tristan's feet?

Question 2 .

Directions: Select the correct answer from each drop-down menu.

Jacob and Sophia are in a running club and record how long it takes them to run a 5-kilometer race. Jacob's time was 4 minutes under the average time of the running club. The difference between Jacob's time and Sophia's time is 10 minutes.

The possible times of Sophia's run are ▾ minutes below the average or ▾ minutes above the average.

Question 3 .

A quarterback rushed for a gain of 9 yards in the first play of a football game. On the very next play, he was sacked and lost 9 yards. How many total yards did the quarterback gain in the first two plays?

A. 18

B. 9

C. 0

D. -9

Question 4 .

Which of the following situations would combine to make zero?

A. Amy drives for three hours along an Interstate highway. She then drives for three hours along county highways.

B. Manuel spent five hours exercising this weekend. He also spent five hours watching television.

C. Chris walks four blocks west to the grocery store. After buying groceries, he walks four blocks east.

D. Julia took two math practice tests last month. She plans to take two more tests later this month.

Question 5 .

Directions: Select ALL the correct answers.

The table below lists some transactions from Bernie's recent activity in his checking account.

Item	Amount
Groceries	-$22
Gas	-$36
Babysitting	$36
Movies	-$29
Mowing Lawns	$22
Tutoring	$51
Field Trip	-$10
Lunch	-$5
Allowance	$10

Select all the pairs of transactions that, when combined, create a transaction with a balance of $0.

- movies and mowing lawns
- lunch and tutoring
- groceries and babysitting
- groceries and mowing lawns
- field trip and allowance
- gas and babysitting

Question 6 .

Directions: Select the correct location on the number line.

Chauncey's birthday is in January. For his last birthday, the low temperature for the day was 9 °F. It was only 12 degrees above the all-time record low for Dallas, Texas. What is the all-time record low for Dallas?

Question 7 .

Directions: Select the correct answer from each drop-down menu.

Complete the sentence to create a true statement.

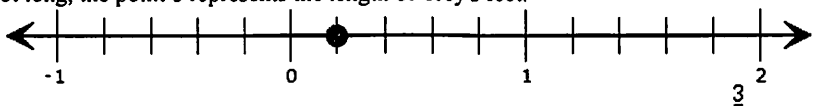
The additive inverse of 9.9 is ▾ , because the ▾ of the two numbers is equal to ▾ .

Answers

1. --
2. --
3. C
4. C
5. --
6. --
7. --

Explanations

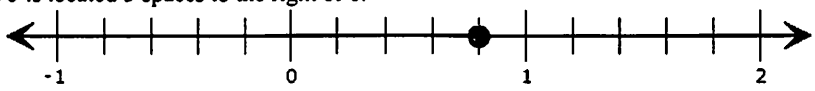
1. Since Trey's feet are $\frac{1}{5}$ of a foot long, the point $\frac{1}{5}$ represents the length of Trey's feet.



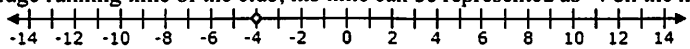
Since Tristan's feet are $\frac{3}{5}$ of a foot longer than Trey's, the point that represents Tristan's feet is the sum of $\frac{3}{5}$ of a foot and $\frac{1}{5}$ of a foot.

$$\frac{1}{5}\text{ ft} + \frac{3}{5}\text{ ft} = \frac{4}{5}\text{ ft}$$

On the number line, the point $\frac{4}{5}$ is located 3 spaces to the right of $\frac{1}{5}$.



2. Using the number line below, the average running time of the club to complete a 5-kilometer race can be represented by zero. Since Jacob's run time is 4 minutes below the average running time of the club, his time can be represented as -4 on the number line.



The difference between Jacob's time and Sophia's time is 10 minutes.
Find Sophia's time if she is 10 minutes faster than Jacob, or 10 units to the left of Jacob's time.

$$-4 - |-10| = -4 - 10$$

$$= -14$$

So, if Sophia is faster than Jacob, her time would be 14 minutes below the average.
Find Sophia's time if she is 10 minutes slower than Jacob, or 10 units to the right of Jacob's time.

$$-4 + |-10| = -4 + 10$$

$$= 6$$

So, if Sophia is slower than Jacob, her time would be 6 minutes above the average.
Therefore, the possible times of Sophia's run are **14** minutes below the average or **6** minutes above the average.

3. A gain in yards represents a positive number, and a loss in yards represents a negative number.

A gain of 9 yards and a loss of 9 yards are additive inverses. The sum of a number and its additive inverse is zero.

$$9 + (-9) = \mathbf{0}$$

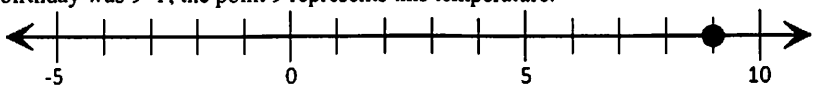
4. Suppose that the number of blocks walked westbound is a positive number. Then the number of blocks walked eastbound is a negative number.

Since Chris walks four blocks west and then four blocks east, the resulting change in his position is the sum of a number and its opposite.

$$4 \text{ blocks} + (-4 \text{ blocks}) = 0$$

5. The balance will equal 0 if the two transactions have opposite values.
Gas: -$36 and Babysitting: $36
Since -$36 and $36 are opposites, **gas and babysitting** combine to make a transaction with a balance of $0.
Field Trip: -$10 and Allowance: $10
Since -$10 and $10 are opposites, **field trip and allowance** combine to make a transaction with a balance of $0.
Groceries: -$22 and Mowing Lawns: $22
Since -$22 and $22 are opposites, **groceries and mowing lawns** combine to make a transaction with a balance of $0.

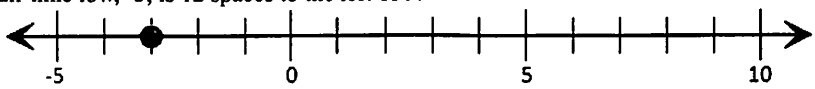
6. Since the low on Chauncey's birthday was 9 °F, the point 9 represents this temperature.



Since the all-time low is 12° below 9 °F, the all-time low is 12 less than 9.

$$9 - 12 = -3$$

The point that represents the all-time low, -3, is 12 spaces to the left of 9.



7. A number and its opposite are additive inverses, and always sum to zero.
Therefore, the additive inverse of 9.9 is **-9.9**, because the **sum** of the two numbers is equal to **0**.

$$(9.9) + (-9.9) = 0$$

Properties of Addition and Subtraction

Question 1 .

Directions: Select ALL the correct answers.

Select all pairs of numbers that are additive inverses.

$4\frac{3}{8}, -4\frac{3}{8}$

$-(-9), -9$

$-7.4, -(-7.4)$

$-2.36, 2.36$

$\frac{2}{3}, -\frac{2}{3}$

$-\frac{6}{7}, \frac{7}{6}$

$-\frac{33}{5}, -(-\frac{5}{33})$

Question 2 .

Directions: Select all the correct answers.

Which of the following situations describe quantities that combine to make 0?

To start the second half of the basketball game, the Eagles made a jump shot for two points. The Bulldogs then took the ball down the court on a fast break and made a layup for two points.

Emily received a check from her grandmother for $40.00 for her birthday. To cash the check, her bank requires her to deposit the funds into her account. Since she wanted to spend the money that afternoon, she withdrew $40.00 in the same transaction.

During the top of the fourth inning of a baseball game, the Ravens scored three runs. During the bottom of the fourth inning, the Raiders scored five runs to tie the game.

A carbon 12 atom has six neutrons, six protons, and six electrons. The neutrons have no charge, each proton has a positive charge, and each electron has a negative charge of the same magnitude.

Marcus runs a sightseeing service in the Appalachian Mountains. The first leg of the tour is a 16.2-mile horseback ride from the stables up the side of a mountain. The second leg of the tour is a 20.6-mile four-wheeler ride taking a different path down the mountain to the customer parking lot.

Jacoby went on a hiking trip on the Rocky Bend Loop. Starting at an elevation of 1,200 feet, he hiked up the eastern trail leading to a change in elevation of 782 feet to get to the campsite. The next day he hiked down the western trail which had a change in elevation of 782 feet to get back to his car.

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Question 4 .

A quarterback rushed for a gain of 9 yards in the first play of a football game. On the very next play, he was sacked and lost 9 yards. How many total yards did the quarterback gain in the first two plays?

A. 18

B. -9

C. 0

D. 9

Question 5 .

Directions: Drag each point to the correct location on the number line.

Jean climbed $\frac{2}{3}$ of the distance to the top of the cliff as shown on the number line. Terry climbed $\frac{1}{3}$ of the distance less than Jean. Steve climbed $\frac{1}{5}$ of the distance more than Jean. Drag the points to the correct locations on the number line.

Terry Steve

Question 6 .

Directions: Use the drawing tool(s) to form the correct answers on the provided number line.

Aiden is a boxer and is trying to reach his target weight, which is represented by the zero mark on the number line.

Yesterday, Aiden was 0.25 pounds below his target.

Today, he weighed himself and found that his weight had changed 1.5 pounds from yesterday.

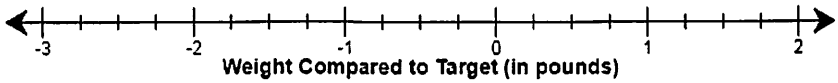
Plot the points that might represent Aiden's weight today compared to his target weight on the number line provided.

Drawing Tools

Select

Point

Click on a tool to begin drawing. Delete Undo Reset



Weight Compared to Target (in pounds)

Answers

1. --
2. --
3. --
4. C
5. --
6. --

Explanations

1. A number and its additive inverse are opposites of each other. Therefore, all additive inverses will always have a sum of zero. Add each pair of numbers to determine which pairs are additive inverses of each other.

$$-\frac{6}{7} + \frac{7}{6} = \frac{13}{42}$$

$$-\frac{33}{5} + -\left(-\frac{5}{33}\right) = -\frac{33}{5} + \frac{5}{33} = 6\frac{74}{65}$$

The numbers in the expressions above are negative reciprocals of each other and do not sum to zero.
Notice that the numbers in the following expressions are opposites of each other and sum to zero.

$$\frac{2}{3} + \left(-\frac{2}{3}\right) = 0$$

$$-2.36 + 2.36 = 0$$

$$4\frac{3}{8} + \left(-4\frac{3}{8}\right) = 0$$

$$-7.4 + -(-7.4) = -7.4 + 7.4 = 0$$

$$-(-9) + (-9) = 9 + (-9) = 0$$

Therefore, the following pairs of numbers are additive inverses.

$\frac{2}{3}$, $-\frac{2}{3}$	−2.36, 2.36	$4\frac{3}{8}$, $-4\frac{3}{8}$	−7.4, −(−7.4)	−(−9), −9

2. Protons represent a positive charge, electrons represent a negative charge with the same magnitude, and there are the same number of each in a carbon 12 atom. The resulting charge on the carbon 12 atom is the sum of a number and its opposite quantity.

$$6^{+} + 6^{-} = 0$$

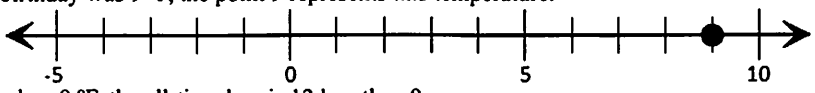
A deposit represents a positive number, and a withdrawal represents a negative number. Since Emily deposited $40.00 and withdrew $40.00 during the transaction, the resulting change in her account is the sum of a number and its opposite.

$$\$40.00 + (-\$40.00) = 0$$

Hiking up with a change in elevation is a positive number, and hiking down with a change in elevation is a negative number. Since Jacoby went up 782 feet in elevation and down 782 feet in elevation, the resulting change in elevation is the sum of a number and its opposite.

$$782\text{ feet} + (-782\text{ feet}) = 0$$

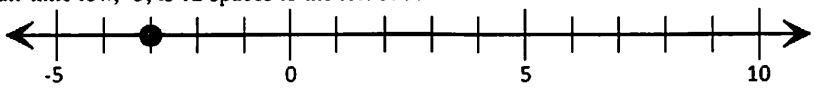
3. Since the low on Chauncey's birthday was 9 °F, the point 9 represents this temperature.



Since the all-time low is 12° below 9 °F, the all-time low is 12 less than 9.

$$9 - 12 = -3$$

The point that represents the all-time low, -3, is 12 spaces to the left of 9.



4. A gain in yards represents a positive number, and a loss in yards represents a negative number.

A gain of 9 yards and a loss of 9 yards are additive inverses. The sum of a number and its additive inverse is zero.

$$9 + (-9) = 0$$

5. Jean climbed $\frac{2}{3}$ of the distance up the cliff. This is marked on the number line.

Terry climbed $\frac{1}{3}$ of the distance less than Jean. Use addition to find the height to where Terry climbed.

$$\frac{2}{3} + \left(-\frac{1}{3}\right) = \frac{1}{3}$$

So, Terry climbed $\frac{1}{3}$ of the total distance.

Steve climbed $\frac{1}{5}$ of the total distance more than Jean. Use addition to find the point to where Steve climbed.

$$\frac{2}{3} + \frac{1}{5} = \frac{10}{15} + \frac{3}{15}$$

$$= \frac{13}{15}$$

So, Steve climbed $\frac{13}{15}$ of the total distance.

6. Aiden's target weight is represented by the zero mark on the number line. Therefore, the numbers to the left of zero, the negative numbers, represent weights below the target. Numbers to the right of zero, the positive numbers, represent weights above his target.
Yesterday, Aiden was 0.25 pounds below his target. That means his current weight can be represented as -0.25 on the number line.
Today, he weighed himself and found that his weight had changed 1.5 pounds from yesterday.
First, find Aiden's weight compared to his target if he had lost 1.5 pounds. This means 1.5 units to the left of -0.25 on the number line.

$$-0.25 - |-1.5| = -0.25 - 1.5$$

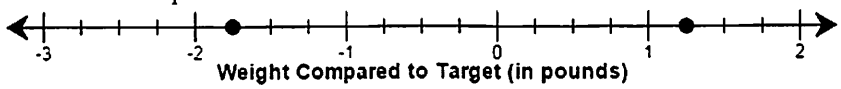
$$= -1.75$$

Now, find his weight compared to his target if he had gained 1.5 pounds. This means 1.5 units to the right of -0.25 on the number line.

$$-0.25 + |-1.5| = -0.25 + 1.5$$

$$= 1.25$$

The number line below shows **-1.75** and **1.25** plotted.



Weight Compared to Target (in pounds)