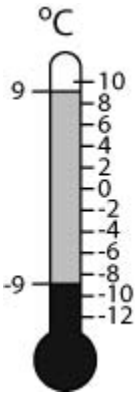
Directions: Answer the following question(s).

1 Yesterday, the temperature in a city dropped from 9°C to –9°C, as shown below.



The expression 9 + (–18) represents the final temperature. Which of the following is an equivalent way to describe this temperature?

A. |–9| degrees in a positive direction from 9 degrees

B. |–18| degrees in a negative direction from 9 degrees

C. |–9| degrees in a negative direction from 9 degrees

D. |–18| degrees in a positive direction from 9 degrees

2 A plane is flying at 32,460 feet. To avoid some turbulence, the plane ascends 1645 feet. It then descends $\frac{3}{5}$ of its new height to prepare for landing. What are the heights that the plane will be at after it ascends to avoid turbulence and after it descends to prepare for landing? Select ALL that apply.

A. 12,326

B. 13,642

C. 18,489

D. 20,463

E. 30,815

F. 34,105

3 Select all values equal to $\frac{1}{6}$.

A. $\frac{-1}{-6}$

B. $\frac{-1}{6}$

C. $-\left(\frac{-1}{6}\right)$

D. $\frac{1}{-6}$

E. $-\left(\frac{1}{-6}\right)$

4 Which fractions are equal to $\frac{-9}{36}$?

A. $\frac{3}{-12}$

B. $\frac{-1}{4}$

C. -4

D. $\frac{3}{12}$

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

F. 4

Directions: Answer the following question(s).

5 Which of the following situations have a sum of 0? Select *all* that apply.

A. The temperature drops $15°$ from $5:00\text{a.m.}$ to $6:00\text{a.m.}$. The temperature then rises $15°$ from $6:00\text{a.m.}$ to $7:00\text{a.m.}$.

B. The temperature drops $14°$ from $6:00\text{a.m.}$ to $8:00\text{a.m.}$. The temperature then drops $14°$ from $8:00\text{a.m.}$ to $10:00\text{a.m.}$.

C. The temperature was $-3°$ at $4:00\text{a.m.}$. The temperature then rose $3°$ from $4:00\text{a.m.}$ to $5:00\text{a.m.}$.

D. The temperature was $7°$ at $11:00\text{a.m.}$. The temperature then drops $7°$ from $11:00\text{a.m.}$ to $1:00\text{p.m.}$.

E. The temperature was $-5°$ at $9:00\text{a.m.}$. The temperature then dropped $5°$ from $9:00\text{a.m.}$ to $10:00\text{a.m.}$.

F. The temperature was $10°$ at $7:00\text{a.m.}$. The temperature then rose $10°$ from $7:00\text{a.m.}$ to $8:00\text{a.m.}$.

6 Which of the following expressions have a value that is less than -2? Select two that apply.

A. $0.25 - 2.50$

B. $-4.25 - (-2.75)$

C. $-3.25 - 1.75$

D. $-4.50 - (-5.25)$

E. $3.25 - (4.75)$

F. $-4.00 - (-2.25)$

7 Which of the following correctly shows the distributive property?

A. $4(x + 5) = 5(x + 4)$

B. $4(x + 5) = (4)(x) + 5$

C. $4(x + 5) = x + (4)(5)$

D. $4(x + 5) = (4)(x) + (4)(5)$

8 Simplify:

$3(2x - 6) + x$

A. $6x - 18$

B. $7x - 6$

C. $7x - 18$

D. $5x - 6 + x$

9 How do you write the fraction $\frac{5}{8}$ as a decimal?

A. .0625

B. .16

C. .625

D. 1.6

10 Find the sum and reduce to LOWEST terms:

$\frac{1}{6} + \frac{8}{15} =$

A. $\frac{21}{30}$

B. $\frac{3}{7}$

C. $\frac{7}{10}$

D. $\frac{9}{21}$

11 Which of the following could be the *first* step in solving this problem?

$9(12 - 3) + 4$

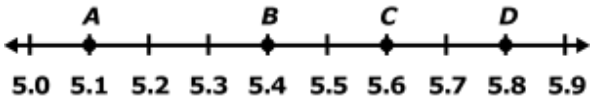
A. $9(3) + 12 - 4$

B. $9(9) + 4$

C. $9(12) - 7$

D. $9(12) - 3 + 4$

Directions: Answer the following question(s).

12 

Which letter represents the fraction $5\frac{4}{5}$ in decimal form?

A. A
B. B
C. C
D. D

13 Hayley is making trail mix using the ingredients listed below.

$2\frac{1}{2}$ cups cereal
$\frac{3}{4}$ cup nuts
$\frac{1}{4}$ cup coconut
$1\frac{1}{4}$ cups chocolate chips

What is the total amount of all four ingredients?

A. $2\frac{1}{4}$ cups
B. $2\frac{3}{4}$ cups
C. $3\frac{1}{2}$ cups
D. $4\frac{3}{4}$ cups

14 Which of the following is closest to $\mathbf{45\frac{1}{8} + 4\frac{6}{7}}$?

A. 9
B. 40
C. 50
D. 200

15 Which of the following is closest to $\left(\mathbf{14\frac{5}{6}}\right)\left(\mathbf{10\frac{1}{10}}\right)\left(\mathbf{1\frac{8}{9}}\right)$?

A. 14
B. 27
C. 150
D. 300

16 Which of the following is closest to $\mathbf{15\frac{1}{8} + 4\frac{3}{4}}$?

A. 75
B. 20
C. 10
D. 3

17 Evaluate the equation.

$-6(-12) =$

A. -72
B. -18
C. 0.5
D. 72

18 What is the value of $\left(\frac{2}{5}\right)^3$?

A. $\frac{6}{125}$
B. $\frac{8}{125}$
C. $\frac{6}{15}$
D. $\frac{6}{5}$

Directions: Answer the following question(s).

19 Bruce claims that for any two integers *r* and *s*, the location of *r* + *s* is to the right of *r* on the number line.

Which statement BEST classifies Bruce's claim?

A. Bruce's claim is never true for two integers *r* and *s*.

B. Bruce's claim is true only when *r* is a positive integer.

C. Bruce's claim is true only when *s* is a positive integer.

D. Bruce's claim is always true for any two integers *r* and *s*.

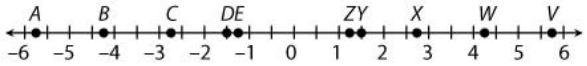
20 Ken has saved $120 in his bank account. Do the following situations leave Ken with a balance of $0?

Select Yes or No for each situation.

Web Only Interaction

21 At the start of the day, a bag of rice contains $5\frac{3}{4}$ cups of rice. That day, the rice is used for two different recipes, one that uses $1\frac{1}{2}$ cups and then one that uses $2\frac{3}{4}$ cups.

Several values are shown on the number line below.



Drag and drop the correct letters to make the statements below true.

Web Only Interaction

22 Drag and drop all the expressions below into the appropriate boxes.

Web Only Interaction

23 What two numbers are located exactly $\frac{3}{5}$ units from $\frac{3}{5}$ on the number line?

Plot the location of these numbers on the number line.

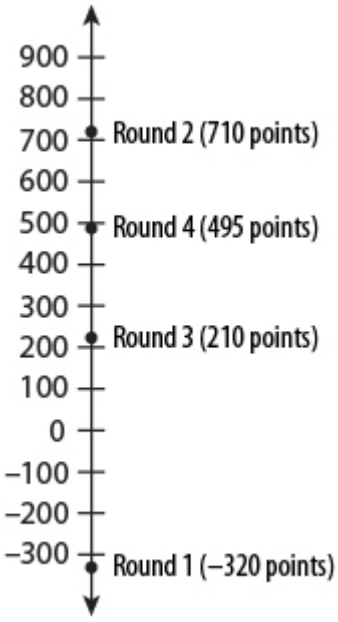
Web Only Interaction

24 What two numbers are located exactly $\frac{3}{4}$ units from $\frac{1}{4}$ on the number line?

Plot the locations of these numbers on the number line.

Web Only Interaction

25 The number line below shows the four scores that Andy has at the end of each of the four rounds of a science competition. Points can either be added to or deducted from the previous round's score depending on how many questions he answered correctly or incorrectly.



Enter the difference, in points, between the scores after Round 1 and after Round 4.

Use the on-screen keyboard to type your answer in the box below.

Web Only Interaction

Directions: Answer the following question(s).

26 Solve:

$(-15) + (-12) =$

A. -27
B. -3
C. 3
D. 27

27 Evaluate:

$-20 - 6 =$

A. 26
B. 14
C. -14
D. -26

28 Solve and simplify.

$\frac{2}{7} \div \frac{4}{5} =$

A. $\frac{2}{7}$
B. $\frac{8}{35}$
C. $\frac{10}{28}$
D. $\frac{5}{14}$

29 Select the expression equivalent to $4(x - 7) + 8$.

A. $4x - 47 + 8$
B. $4(x - 15)$
C. $4x - 7 + 8$
D. $4x - 28 + 8$

30 Josh paid $212.72 for 4 pairs of pants. All 4 pairs of pants were the same price. How much did each pair of pants cost?

A. $53.18
B. $106.36
C. $208.72
D. $850.88

31 Which of the following is closest to the solution to the problem below?

$\left(20\frac{3}{7}\right)(14)$

A. 300
B. 140
C. 120
D. 35

32 $\frac{13}{16} - \left(\frac{1}{4} + \frac{3}{8}\right) =$

A. $\frac{3}{16}$
B. $\frac{15}{16}$
C. $\frac{17}{16}$
D. $2\frac{1}{4}$

33 The public library has to move 42,000 books to its new location. The movers can pack an average of 45 books in every box.

Part A:
How many boxes will the library need?

Part B:
The truck that the movers are using holds 250 boxes. How many trips will the movers need to make with the truck?

Directions: Answer the following question(s).

34 Determine if the following argument always applies, sometimes applies, or never applies. Provide at least 2 examples in your explanation.

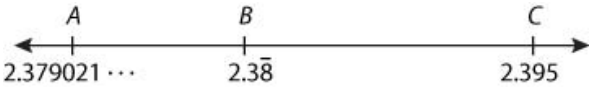
"The sum of a number and its opposite is always 1."

35 Which of the following decimals appear to be rational numbers? Choose ALL that are correct.

A. 7.0625
B. 41.45454545454545...
C. 11.31370849898476...
D. 75.66666666666666...
E. 31.41592653589793...

36 The number line shows the locations of three decimal numbers.

- A has a decimal representation that neither stops nor repeats.
- B has a decimal representation that repeats.
- C has a decimal representation that terminates.



Which of the numbers are rational numbers? Explain your answer.

37 Select the expression equivalent to $(-13x - 15) - (-9x + 16)$.

A. $4x - 31$
B. $-4x + 1$
C. $-4x - 31$
D. $-22x - 31$

38 Select the expression equivalent to $(6x + 5) - (4x - 6)$.

A. $2x + 11$
B. $2x - 1$
C. $10x + 11$
D. $10x - 1$

39 Which of the following is equivalent to the expression shown?

$(-5)(3)(-4)(-2)$

A. -120
B. -8
C. -2
D. 120

40 Simplify.

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

A. $-\frac{6}{8}$
B. $-\frac{3}{8}$
C. $-\frac{9}{8}$
D. $\frac{3}{8}$

41 Felix writes the math problem below.

$(-3)(-5 + (-8)) = n$

Which is true?

A. $n = -39$
B. $n = -9$
C. $n = 9$
D. $n = 39$

Directions: Answer the following question(s).

42 What is the value of the expression shown?

$$\frac{1}{2}(6.2 - 0.04)$$

A. 2.7
B. 2.9
C. 3.06
D. 3.08

43 What is the value of this expression?

$$8 - (12 - (-4))$$

A. –16
B. –8
C. 0
D. 8