

Zizhong County's 2017-2018 First Semester Mid-term 7th Grade Mathematics Test

(Full score 120 points, 120-minute test)

Section I (Multiple Choice, full score 48 points)

One, multiple choice (12 questions, 4 points per question, full score 48 points)

1. -5 has a reciprocal of ()
 A. 5 B. $\frac{1}{5}$ C. -5 D. $-\frac{1}{5}$
2. Calculate $-2+1$: ()
 A. -3 B. -1 C. 1 D. 3
3. Which one of the following expressions are negative? ()
 A. $-(-3)$ B. $-|-3|$ C. 3^2 D. $(-3)^2$
4. 1339 thousands written in scientific notation is ()
 A. 1.339×10^2 B. 1.339×10^3 C. 1.339×10^6 D. 0.1339×10^7
5. Which pairs are opposite numbers? ()
 A. $-\frac{1}{7}$ and 0.7 B. $\frac{1}{3}$ and -0.333 C. $-(-2)$ and 2 D. $-\frac{1}{4}$ and 0.25
6. Which of the following equations are correct? ()
 A. $(-2)^3 = -6$ B. $\left|-\frac{1}{10}\right| > -10$ C. $-\frac{3}{4} < -\frac{4}{5}$ D. $(-2)^4 = -2^4$
7. 3.29523 approximate to the hundredths place is ()
 A. 3.295 B. 3.29 C. 3.30 D. 3.3
8. If $|x| = -x$, then x is ()
 A. positive B. negative C. non-negative D. non-positive

9. Which of the following statements are correct? ()

A. The square of a rational number is always positive.

B. Any number has an absolute value, reciprocal, and opposite number.

C. If two numbers have the same absolute value, they must be opposite numbers

D. If several rational numbers are multiplied, and the number of negative factors is odd, then their product must be negative.

10. If $a + b < 0$ · $ab > 0$ · then ()

A. $a < 0, b < 0$ B. $a > 0, b > 0$ C. $a > 0, b < 0$ D. $a < 0, b > 0$

11. A point on the number line that represents an integer. The unit length of a certain segment is 1 cm. If a line segment AB with a length of 2017 cm is randomly drawn on this number line, the number of points covered by the line segment AB has a total of () .

A. 2018 or 2019 B. 2017 or 2018 C. 2016 or 2017 D. 2015 or 2016

12. Calculate $(-2)^{2016} + (-2)^{2017}$: ()

A. 2^{2016} B. -2^{4033} C. -2 D. -2^{2016}

Section II (Non-selective questions, full score 72 points)

Two, fill in the blanks (4 questions, 4 points per question, full score 16 points)

13. Calculate: $3 \times (-5) =$ _____.

14. Given that $x^2 = 9$ · and $x < 0$ · then $x =$ _____.

15. If a · b are reciprocals, m · n are opposite numbers, then $4(m + n) - 5ab =$ _____.

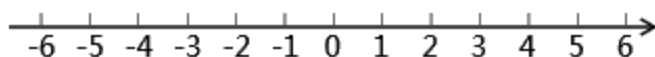
16. If $\frac{|a|}{a} + \frac{|b|}{b} + \frac{|c|}{c} = 1$ · then $\frac{ab}{|ab|} + \frac{bc}{|bc|} + \frac{ac}{|ac|} + \frac{abc}{|abc|} =$ _____.

Three, short answer questions (6 questions, full score 56 points)

17. (6 points)

Plot all of the numbers on the number line, and then use the " $<$ " sign to order them from least to greatest

$$-3 \cdot 0 \cdot 1\frac{1}{2} \cdot 4.5 \cdot -1$$



18. Calculate (Every problem is 4 points, full score 16 points)

$$(1) 15 + (-8) - (-4) - 5 \quad (2) \left(-\frac{5}{12} + \frac{3}{4} - \frac{1}{6}\right) \times (-48)$$

$$(3) -10 + 8 \div (-2^2) - (-4) \div \left(-\frac{1}{3}\right) \quad (4) -1^4 - (1 - 0.5) \times \frac{1}{3} \times [5 - (-3)^2]$$

19. (6 points)

During the National Day Golden Week, Lily's family went to Mount Emei for a tour. It is known that the temperature of Mount Emei decreases by 0.3° for every 50 meters above sea level. It is 3080 meters tall. One day, the minimum temperature of Baoguo Temple at the foot of the mountain is 14°C . What is the temperature of the golden top on the top of the mountain at this time?

20. (5 points per question, full score 10 points)

(1) Given that $(a + 2)^2$ and $|b + 1|$ are opposite numbers, find $(a - b)^{2017}$.

(2) If $|x| = 3$, $|y| = 2$, and $x > y$, find $x + y$.

21. (9 points)

A bicycle factory plans to produce 1,400 bicycles a week, with an average of 200 bicycles per day. Due to various reasons, the actual daily production volume is different from the planned volume. The following table shows the production situation for a certain week (overproduction is positive, reduction is negative):

Week	One	Two	Three	Four	Five	Six	Seven
Differing Amount	+5	-2	-4	+13	-10	+16	-9

(1) How many more cars are produced on the most productive day than on the least productive day?

(2) The factory implements a weekly piece-rate wage system. Each car produced will receive 60 dollars. If the task is exceeded, each excess will be rewarded by 20 dollars, and the production of one less car will be deducted by 15 dollars. What is the total amount given from Week One to Week Seven?

22. (9 points)

We know that: $1 - \frac{1}{2} = \frac{2}{1 \times 2} - \frac{1}{1 \times 2} = \frac{1}{1 \times 2}$; $\frac{1}{2} - \frac{1}{3} = \frac{3}{2 \times 3} - \frac{2}{2 \times 3} = \frac{1}{2 \times 3}$;

$\frac{1}{3} - \frac{1}{4} = \frac{4}{3 \times 4} - \frac{3}{3 \times 4} = \frac{1}{3 \times 4}$; ... ,

So, we also know that: $\frac{1}{1 \times 2} = 1 - \frac{1}{2}$; $\frac{1}{2 \times 3} = \frac{1}{2} - \frac{1}{3}$; $\frac{1}{3 \times 4} = \frac{1}{3} - \frac{1}{4}$; ... ,

Adding those two equations: $\frac{1}{1 \times 2} + \frac{1}{2 \times 3} + \frac{1}{3 \times 4} = 1 - \frac{1}{2} + \frac{1}{2} - \frac{1}{3} + \frac{1}{3} - \frac{1}{4} = 1 - \frac{1}{4} = \frac{3}{4}$.

(1) Solve: $\frac{1}{1 \times 2} + \frac{1}{2 \times 3} + \frac{1}{3 \times 4} + \frac{1}{4 \times 5} + \frac{1}{5 \times 6} + \frac{1}{6 \times 7} = \underline{\hspace{2cm}}$;

(2) Calculate: $\frac{1}{1 \times 5} + \frac{1}{5 \times 9} + \frac{1}{9 \times 13} + \dots + \frac{1}{97 \times 101}$;

(3) Calculate: $\frac{1}{1 \times 4 \times 7} + \frac{1}{4 \times 7 \times 10} + \frac{1}{7 \times 10 \times 13} + \dots + \frac{1}{94 \times 97 \times 100}$

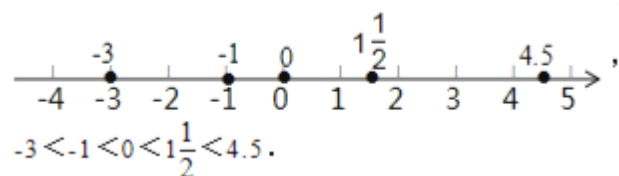
Answer Key

1 - 5: DBBCD 6 - 10 : BCDCA

11 - 12 : BD

13, - 5 14, - 3 15, - 5 16, - 2

17,



18、

S: $(1) 15 + (-8) - (-4) - 5$

$$= 15 + (-8) + 4 + (-5)$$

$$= 6;$$

(2) $(-\frac{5}{12} + \frac{3}{4} - \frac{1}{6}) \times (-48)$

$$= -\frac{5}{12} \times (-48) + \frac{3}{4} \times (-48) - \frac{1}{6} \times (-48)$$

$$= 20 + (-36) + 8$$

$$= -8;$$

(3) $-10 + 8 \div (-2^2) - (-4) \div (-\frac{1}{3})$

$$= -10 + 8 \div (-4) - 4 \times 3$$

$$= -10 + (-2) - 12$$

$$= -24;$$

(4) $-1^4 - (1 - 0.5) \times \frac{1}{3} \times [5 - (-3)^2]$

$$= -1 - \frac{1}{2} \times \frac{1}{3} \times [5 - 9]$$

$$= -1 - \frac{1}{2} \times \frac{1}{3} \times (-4)$$

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

$$= -\frac{1}{3}.$$

19 、

S: From the problem,

The temperature at the summit of the mountain is: $14 + (3080 - 530) \div 50 \times (-0.3) = -1.3$ degrees

A: The temperature at the summit of the mountain is -1.3 degrees

20 、

S: (1) Because $(a + 2)^2$ and $|b + 1|$ are opposite numbers,

So $(a + 2)^2 + |b + 1| = 0$,

Meaning $a + 2 = 0$, $b + 1 = 0$,

Solving $a = -2$, $b = -1$,

So, the original equation = -1.

(2) Because $|x|=3$, $|y|=2$, and $x>y$,

Then $x=3$, $y=2$, or $x=3$, $y=-2$,

So $x + y = 5$ or 1 .

21 ∙

S: (1) $16 - (-10) = 26$.

A: The difference of most cars produced and the least cars produced per day was 9 cars.

(2) $5 - 2 - 4 + 13 - 10 + 16 - 9 = 9$,

$(1400 + 9) \times 60 + 9 \times 15 = 84675$ dollars.

A: The workers of this factory was paid a total of 84675 dollars.

22 ∙

$$\begin{aligned}
 S: & \quad (1) \quad \frac{1}{1 \times 2} + \frac{1}{2 \times 3} + \frac{1}{3 \times 4} + \frac{1}{4 \times 5} + \frac{1}{5 \times 6} + \frac{1}{6 \times 7} \\
 &= 1 - \frac{1}{2} + \frac{1}{2} - \frac{1}{3} + \frac{1}{3} - \frac{1}{4} + \dots + \frac{1}{6} - \frac{1}{7} \\
 &= 1 - \frac{1}{7} \\
 &= \frac{6}{7},
 \end{aligned}$$

故答案为: $\frac{6}{7}$;

$$\begin{aligned}
 \text{Answer:} & \quad \frac{1}{1 \times 5} + \frac{1}{5 \times 9} + \frac{1}{9 \times 13} + \dots + \frac{1}{97 \times 101} \\
 &= \frac{1}{4} \times \left(1 - \frac{1}{5} + \frac{1}{5} - \frac{1}{9} + \frac{1}{9} - \frac{1}{13} + \dots + \frac{1}{97} - \frac{1}{101} \right) \\
 &= \frac{1}{4} \times \left(1 - \frac{1}{101} \right) \\
 &= \frac{1}{4} \times \frac{100}{101} \\
 &= \frac{25}{101};
 \end{aligned}$$

$$\begin{aligned}
 (3) & \quad \frac{1}{1 \times 4 \times 7} + \frac{1}{4 \times 7 \times 10} + \frac{1}{7 \times 10 \times 13} + \dots + \frac{1}{94 \times 97 \times 100} \\
 &= \frac{1}{6} \left(\frac{1}{1 \times 4} - \frac{1}{4 \times 7} + \frac{1}{4 \times 7} - \frac{1}{7 \times 10} + \frac{1}{7 \times 10} - \frac{1}{10 \times 13} + \frac{1}{94 \times 97} - \frac{1}{97 \times 100} \right) \\
 &= \frac{1}{6} \left(\frac{1}{4} - \frac{1}{9700} \right) \\
 &= \frac{101}{2425}
 \end{aligned}$$