

Inner Mongolia Wuhai City 2017-2018 Schoolyear 7th Grade Math Last Semester Mid-Term Exam

(Full score 120 points)

One, multiple choice (3 points, full score 36 points)

1. Which of the following rational numbers is negative? ()

- A · 1 B · 0 C · -1 D · 2

2. From the following, which pair are opposite numbers? ()

- A. $-(-2)$ and 2 B. $+(-3)$ and $-(+3)$ C. $\frac{1}{2}$ and -2 D. $-(-5)$ and $-|-5|$

3. On May 27, 2008, the torch relay of the Beijing 2008 Olympic Games was held in Nanjing. The whole route of the torch relay is about 12,900m. Using scientific notation, 12,900m can be recorded as ()

- A · 129×10^2 m B · 12.9×10^3 m C · 1.29×10^4 m D · 0.129×10^5 m

4. From the following, which calculation is true? ()

A · $3a + 2b = 5ab$

B · $5y^2 - 3y^2 = 2$

C · $-12x + 7x = -5x$

D · $4m^2n - 2mn^2 = 2mn$

5. a · b are reciprocals, x · y are opposite numbers, $y \neq 0$ · then algebraic expression:

$(a+b)(x+y) - ab - \frac{x}{y}$ is equal to ()

- A.2 B.0 C. -1 D.1

6. Which one of the following is the like term of $-\frac{1}{2}x^2y$? ()

- A · $2x^2$ B · $2yx^2$ C · $2xyz$ D · $2xy$

7. If $|a| = (-3)^2$, then a equals ()

- A. -3 B. 3 C. ± 9 D. 9

8. a · b are rational numbers, they are plotted on the number line as shown. Ordering a · $-a$ · b · $-b$ from least to greatest, it would be ()



- A · $-b < a < -a < b$ B · $-a < -b < a < b$

- C · $-b < -a < a < b$ D · $-b < b < -a < a$

9. The purchase price of a certain product is a dollars/apiece. During the peak season, the price of the product is 30% higher than the purchase price; after the peak season, the product will be promoted at a 30% discount (that is, 70% of the original price). The selling price of a piece of this product is ()

- A. a dollars B. $0.7a$ dollars C. $0.91a$ dollars D · $1.03a$ 元

10. $m - n = -1$, then $7 + 3m - 3n$ equals ()

- A. 6 B. -6 C. 4 D. -4

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

A · $a > 0 \cdot b > 0$

B · $a < 0 \cdot b < 0$

C · $a \cdot b$ 异号

D · $a \cdot b$ 异号且负数的绝对值大

12. From the following functions, which one is correct? ()

A. $\frac{y}{3} = 0$, so $y=3$ B. $2x=-3$, so $x = \frac{2}{3}$

C. $y+2=-3$, so $y=-5$ D. $\frac{2}{3}x = \frac{3}{2}$, so $x=1$

Two, fill in the blanks (3 points per question, full score 24 points)

13. Calculate: $-(-3)^3 = \underline{\hspace{2cm}}$ °

14. In a two-digit number, a is the units digit, and the tens digit is b, the value of this two-digit number is: $\underline{\hspace{2cm}}$ °

15. Compare $-\frac{1}{2}$ $\underline{\hspace{1cm}}$ $-\frac{1}{3}$ (fill in "<" or ">") °

16. $3\pi x^2 y + 2^5 x^3 y^2$ 是 $\underline{\hspace{2cm}}$ (写出几次几项式) °

17. If $|a| = 8$, $|b| = 5$ and $a + b > 0$ · then $a - b = \underline{\hspace{2cm}}$ °

18. When $x=-1$, algebraic equation $5x-(4x-1)$ equals $\underline{\hspace{2cm}}$ °

19. If $|x-2| + (y+5)^2 = 0$ · then $x-y = \underline{\hspace{2cm}}$ °

20. Observe the following numbe series: $1, \frac{3}{4}, \frac{5}{9}, \frac{7}{16}, \frac{9}{25}$... then the number representing the nth term is $\underline{\hspace{2cm}}$.

Three, short answer questions (full score 60 points)

21. Calculate (5 points per question, full score 20 points)

(1) $1 + (-2) + |-2 - 3| - 5$

(2) $-2^2 + 3 \times (-1)^4 - (-4) \times 5$

(3) $3a^2 + 2a - 4a^2 - 7a$

(4) $2(2a - 3b) - 3(2b - 3a)$

22. Solve for x (4 points per problem, full score 8 points)

(1) $2x - 8x = -1$

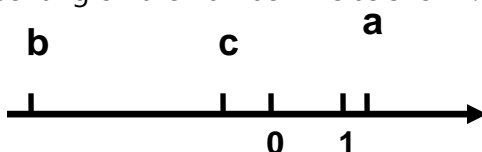
(2) $2x - \frac{1}{3} = -\frac{x}{3} + 2$

23. First simplify, then substitute: $5x^2 + 4 - (3x^2 + 5x) - (2x^2 - 6x + 5)$ • Substitute $x = -3$

(Simplifications worth 5 points, substitution worth 3 points, full score 8 points)

24. (8 points) Real numbers a, b, c is representing on the number line as shown:

Simplify: $|c| + |-a| - |b|$



25. (8 points) In class, Mr. Smith told his students to solve a whole expression. After writing $(7a^3 - 6a^3b) - (-3a^3 - 6a^3b + 10a^3 - 3)$, Mr. Smith asked his students to give a and b's values. After Ashley replied "a=65 · b=-2014", Mr. Smith said the answer "3" without hesitation. His students were baffled and thought it was incredible, but Mr. Smith said in a firm tone: "This answer is accurate." Can you make sense of it?

26. (8 points) A group sold a total of 2,800 refrigerators in three quarters of their sale. The number of refrigerators they sold in the first quarter was two times that of the number of refrigerators they sold in the second quarter. The number of refrigerators sold in the third quarter was twice that of the first quarter. How many refrigerators did the group sell in the second quarter?

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CDCCBBCACDCD

Two, fill in the blanks (3 points per question, full score 24 points)

13. -27 14. $10b+a$
15. < 16. 五次二项式
17. 13 or 3 18. 0
19. 7 20. $\frac{2n-1}{n^2}$

Three, short answer questions (full score 60 points)

21. Calculate (5 points per question, full score 20 points)

S: (1) $1 + (-2) + |-2 - 3| - 5$

S: (2) $-2^2 + 3 \times (-1)^4 - (-4) \times 5$

$= 1 - 2 + 5 - 5$ -----3 points

$= -4 + 3 \times 1 + 4 \times 5$

$= -1$ -----5 points

$= -4 + 3 + 20$ -----3 points

$= 19$ -----5 points

S: (3) $3a^2 + 2a - 4a^2 - 7a$

S: (4) $2(2a - 3b) - 3(2b - 3a)$

$= (3 - 4)a^2 + (2 - 7)a$ -----3 points
 $= -a^2 - 5a$

$= 4a - 6b - 6b + 9a$ -----3 points
 $= 13a - 12b$

-----5 points

-----5 points

22. Solve for x (4 points per problem, full score 8 points)

(1) $2x - 8x = -1$

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

$-6x = -1$ -----2 points

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

$x = \frac{1}{6}$ -----4 points

$\frac{7}{3}x = \frac{7}{3}$ -----3 points

$x = 1$ -----4 points

23. First simplify, then substitute: $5x^2 + 4 - (3x^2 + 5x) - (2x^2 - 6x + 5)$ • Substitute $x = -3$

(Simplifications worth 5 points, substitution worth 3 points, full score 8 points)

S: Original equation = $5x^2 + 4 - 3x^2 - 5x - 2x^2 + 6x - 5$ -----2 points

= $(5-3-2)x^2 + (-5+6)x + 4-5$ -----4 points

= $x - 1$ -----5 points

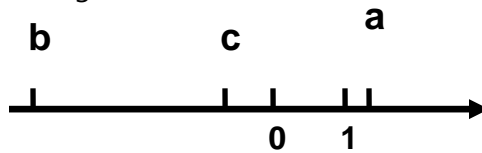
When $x = -3$,

Original equation = $-3 - 1$ -----7 points

= -4 -----8 points

24. (8 points) Real numbers a , b , c is representing on the number line as shown:

Simplify: $|c| + |-a| - |b|$



S: Because $c < 0$ · $-a < 0$ · $b < 0$ -----2 points

So: Original equation = $-c+a - (-b)$ -----5 points

= $-c+a+b$ -----8 points

25.

S: Original equation = $7a^3 - 6a^3b + 3a^3 + 6a^3b - 10a^3 + 3$ -----3 points

=3 -----5 points

It can be seen from the simplification of the polynomial: the value of the polynomial has nothing to do with a and b , no matter what the values of a and b in the polynomial are, the value of the polynomial is 3.

-----8 points

26.

S: Let there have been x refrigerators sold in the second quarter, therefore, $2x$ refrigerators would be sold in the first quarter, and in the third quarter $4x$ refrigerators were sold. The equation given from reading the word problem is:

$$x+2x+4x=2800$$

Solution: $x=400$

Answer: 400 refrigerators were sold in the second quarter.