

2017-2018 7th Grade Mathematics First Semester Mid-Term Exam, Yuechi

County, Guang'an City, Sichuan Province

(full score 150 points, 120-minutes exam time)

Section	On	Two	Three	Four	Five	Total	Name
Full Score	40	32	35	23	20	150	
Score							

Score	Rater

One, multiple choice (10 questions, 4 points per question, full score 40 points)

1. $|-2|$ has a reciprocal of ()

A · $\frac{1}{2}$

B · $-\frac{1}{2}$

C · 2

D · -2

2. The two points that are 2 units from the origin on the number line are ()

A · 2

B · -2

C · 2 or -2

D · 1 or -1

3 · 960,000 written in scientific notation is ()

A · 96×10^5

B · 960×10^4

C · 9.6×10^7

D · 9.6×10^6

4. Which one of the following pairs are **not** like terms? ()

A · $-x^2y$ and $2yx^2$

B · $2\pi R$ and $\pi^2 R$

C · $-m^2n$ and $\frac{1}{2}mn^2$

D · 2^3 and 3^2

5 · Which of the following is correct? ()

A · $2x + 3y = 5xy$

B · $2a^2 + 2a^3 = 2a^5$

C · $4a^2 - 3a^2 = 1$

D · $-2ba^2 + a^2b = -a^2b$

6 · The incorrect statement from the following is ()

A · $2x^2 - 3xy - 1$ is a quadratic trinomial

B · $-x + 1$ is not a monomial

C · $-\frac{2}{3}\pi xy^2$ has a coefficient of $-\frac{2}{3}$

D · -2^2xab^2 has a degree of 4

7 · Calculate the difference of $6a^2 - 5a + 3$ and $5a^2 + 2a - 1$. The correct answer would be ()

A · $a^2 - 3a + 4$

B · $a^2 - 3a + 2$

C · $a^2 - 7a + 2$

D · $a^2 - 7a + 4$

8. The purchase price of a product is a dollars. It is sold at a price that is 20% more expensive than the purchase price. The sales price can be expressed as an algebraic expression as ()

A · $(1 - 20\%)a$

B · $20\%a$

C · $(1 + 20\%)a$

D · $a + 20\%$

9. Two rational numbers, a and b are shown on the number line. Which one of the expressions will be positive? ()



A · $a + b$

B · $a - b$

C · ab

D · $\frac{a}{b}$

10. There is a series of numbers $a_1 \cdot a_2 \cdot a_3 \cdot \dots \cdot a_n$. Starting from the second number, every other number is equivalent to the difference of 1 and its previous number. If $a_1 = 2$, then $a_{2011} = ()$

A · 2011

B · 2

C · -1

D · $\frac{1}{2}$

Score	Rater

Two, fill in the blanks (8 questions, 4 points per question, full score 32 points)

11. Calculate: $-5 \div \frac{1}{5} \times 5 = \underline{\hspace{2cm}}$ $(-1)^{2000} - 0^{2011} + (-1)^{2013} = \underline{\hspace{2cm}}$.

12. Use an algebraic expression: The opposite number of half of three times P is $\underline{\hspace{2cm}}$.

13. If monomials $5x^4y$ and $25x^n y^m$ are like terms, then $m+n$ has a value of _____ .
14. Point A on the number line represents a number four units from -3 . Point A represent _____ .
15. Given that $a^2 - 2a$ has a value of 4 , then the value of $1 + 3a^2 - 6a$ is _____ .
16. Simplify $|\pi - 4| + |3 - \pi| =$ _____ .
17. Given that $|x| = 2$, $|y| = 3$, and $x > y$, then the value of $3x - 4y$ is _____ .
18. As shown, there is a series of figures that go down according to a pattern. The first figure consists of 4 basic shapes, the second figure consists of 7 basic shapes, ..., the n th figures consists of _____ basic shapes (use algebraic expressions).



Score	Rater

Three, short answer question (3 questions, Question 19 is worth 20 points, Question 20 is worth 10 points, Question 21 is worth 5 points, full score 35 points)

19. Calculate (5 points per problem, full score 20 points)

$$(1) 12 - (-16) + (-4) - 5$$

$$(2) (-10) + 8 \times (-2) - (-4) \times (-3)$$

$$(3) -2^2 \div \frac{4}{3} - [2^2 - (1 - \frac{1}{2} \times \frac{1}{3})] \times 12$$

$$(4) (-\frac{3}{4} + \frac{5}{6} - \frac{7}{12} + \frac{3}{15}) \div \frac{1}{60}$$

20. Calculate (5 points per problem, full score 10 points)

$$(1) (4a^2b - 5ab^2) - (3a^2b - 4ab^2)$$

$$(2) 2x^2 - \{-3x + [4x^2 - (3x^2 - x)]\}$$

21. (5 points) First simplify, then substitute: $2x^2y - [3xy^2 + 2(xy^2 + 2x^2y)]$, among them $x = \frac{1}{2}$,
 $y = -2$.

Score	Rater

Four, comprehensive questions (4 questions, Question 22 is worth 5 points, Questions 23, 24, and 25 are each worth 6 points, full score 23 points)

22. (5 points) Draw out the number line, and then plot the following numbers on it. Use the "<" sign to order them from least to greatest.

$$-(-4), -|-3.5|, +\left(-\frac{1}{2}\right), 0, +(2.5), 1\frac{1}{3}, -1^{10}$$

23. (6 points) It is given that ____ and ____ are opposite numbers. ____ and ____ are reciprocals. CHECK ORIGINAL

24. (6 points) The class is splitting up into two groups. One of the groups had x students in it, while the other group had 3 people less than $\frac{4}{5}$ of the first group. If one person was transferred from the second group to the first group, then:

(1) How many people would be left in the second group?

(2) After the transfer, how many more people will the first group have than the second group?

25. (6 points) Given that algebraic expression $A = x^2 + xy + 2y - \frac{1}{2}$ · $B = 2x^2 - 2xy + x - 1$

(1) Find $2A - B$;

(2) When $x = -1$, and $y = -2$, find $2A - B$;

Score	Rater

Five, comprehensive questions (2 questions, Question 26 is worth 10 points, Question 27 is worth 10 points, full score 20 points)

26. (10 points) A bicycle factory plans to produce 1,400 bicycles a week, with an average of 200 bicycles per day, but due to various reasons, the actual daily production volume is different from the planned volume. The following table shows the production situation of a certain week (overproduction is recorded as positive, and reduced production is recorded as negative):

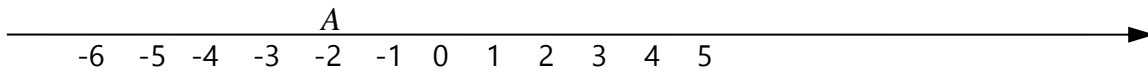
Day	Mon.	Tue.	Wed.	Thu.	Fri.	Sat.	Sun.
Over/under	+5	- 2	- 4	+13	- 10	+16	- 9

production							
------------	--	--	--	--	--	--	--

- (1) According to the recorded data, how many bicycles did the factory make on Thursday?
- (2) According to the recorded data, how many bicycles did the factory actually produce this week?
- (3) How many more bikes are produced on the most productive day than on the least productive day?
- (4) The factory implements a weekly piece-rate wage system. With each car produced, the worker can get 60 dollars. If the task is exceeded, the excess part will be rewarded with 15 dollars per car; if one car is not produced, 20 dollars will be deducted. What is the total amount the worker gained by the end of the week?

27. (10 points) As shown on the number line, point A currently is on -2 .

- (1) Point B is four units right of Point A , write down the number B is on;
- (2) Point A travels left 2 units per second, Point B travels right 2 units per second, when Point A arrives at -6 , find the distance apart from A and B .
- (3) If Point A doesn't move, and Point B continues traveling left, after how many seconds would Points A and B be 4 units from each other.



Answer Key

One, multiple choice (10 questions, 4 points per question, full score 40 points)

A 2、C 3、D 4、C 5、D 6、C 7、D 8、C 9、A 10、B

Two, fill in the blanks (8 questions, 4 points per question, full score 32 points)

11、 $-\frac{125}{2}$ 、0 12、 $-\frac{3p}{2}$ 13、5 14、1 or -7 15、13

16、1 17、6 or 18 18、 $3n+1$

Three, short answer question (3 questions, Question 19 is worth 20 points, Question 20 is worth 10 points, Question 21 is worth 5 points, full score 35 points)

19、Calculation problems

(1) S: Original Equation = $12+16-4-5$2 points

= $28-9$3 points

=19.....5 points

(2) S: Original Equation = $-10+(-16)-12$2 points

= $-10-16-12$3 points

= -385 points

(3) S: Original Equation = $-4 \times \frac{3}{4} - [4 - (1 - \frac{1}{6})] \times 12$... 2 points

= $-3 - (4 - \frac{5}{6}) \times 12$3 points

= $-3 - 4 \times 12 + \frac{5}{6} \times 12$4 points

= $-3 - 48 + 10$

= -415 points

(4) S: Original Equation = $(-\frac{3}{4} + \frac{5}{6} - \frac{7}{12} + \frac{3}{15}) \times 60$ 2 points

$$= -\frac{3}{4} \times 60 + \frac{5}{6} \times 60 - \frac{7}{12} \times 60 + \frac{3}{15} \times 60 \dots 3 \text{ points}$$

$$= -45 + 50 - 35 + 12$$

$$= -18 \dots 5 \text{ points}$$

20、Calculation problems

(1) S: Original Equation = $4a^2b - 5ab^2 - 3a^2b + 4ab^2$ 2 points

$$= a^2b - ab^2 \dots 5 \text{ points}$$

(2) S: Original Equation = $2x^2 - \{-3x + [4x^2 - 3x^2 + x]\}$ 2 points

$$= 2x^2 - \{-3x + x^2 + x\} \dots 3 \text{ points}$$

$$= 2x^2 + 3x - x^2 - x$$

$$= x^2 + 2x \dots 5 \text{ points}$$

21、解：原式 = $2x^2y - [3xy^2 + 2xy^2 + 4x^2y]$

$$= 2x^2y - 3xy^2 - 2xy^2 - 4x^2y$$

$$= -2x^2y - 5xy^2 \dots 3 \text{ points}$$

When $x = \frac{1}{2}, y = -2$

$$\text{Original Equation} = -2 \times \left(\frac{1}{2}\right)^2 \times (-2) - 5 \times \frac{1}{2} \times (-2)^2$$

$$= 1 - 10$$

$$= -9 \dots 5 \text{ points}$$

Four, comprehensive questions (4 questions, Question 22 is worth 5 points, Questions 23, 24, and 25 are each worth 6 points, full score 23 points)

22、S: Correctly represent the corresponding point of each number on the number line

..... 2 points

$$-|-3.5| < -1^{10} < + \left(-\frac{1}{2}\right) < 0 < 1\frac{1}{3} < + (+2.5) < - (-4) \dots\dots 5 \text{ points}$$

23、S: $\because a, b$ are opposite numbers, c, d are reciprocals.

$$\therefore a+b=0, cd=1 \dots\dots 1 \text{ point}$$

$$\text{And } \therefore |m|=2$$

$$\therefore m=2 \text{ or } -2 \dots\dots 2 \text{ points}$$

When $m=2$, Original Equation = $0+1+2-1=2$, when $m=-2$, Original Equation = $0+1-2-1=-2 \dots\dots$
6 points

24、S: (1) \because The second group has $\frac{4}{5}x-3$ (people)..... 1 point

$$\therefore \text{There is a total of : } x + \left(\frac{4}{5}x-3\right) = \frac{9}{5}x-3 \text{ (people) } 2 \text{ points}$$

$$\text{A: There is a total of } \left(\frac{9}{5}x-3\right) \text{ people. } 3 \text{ points}$$

(2) After the transfer, \because the first group had: $x+1$ (people)

$$\text{The second group had: } \frac{4}{5}x-3-1 = \frac{4}{5}x-4 \text{ (people)..4 points}$$

$$\therefore (x+1) - \left(\frac{4}{5}x-4\right) = x+1 - \frac{4}{5}x+4$$

$$= \frac{1}{5}x+5 \text{ (people).....5 points}$$

A: The first group had more people than the second group by $\left(\frac{1}{5}x+5\right)$ people ..6
points

$$25、S: (1) 2A-B=2 \left(x^2+xy+2y-\frac{1}{2}\right) - (2x^2-2xy+x-1) \dots 1 \text{ point}$$

$$=2x^2+2xy+4y-1-2x^2+2xy-x+1 \dots\dots 2 \text{ points}$$

$$=4xy-x+4y \dots\dots 3 \text{ points}$$

(2) When $x=-1$, and $y=-2$

Original Equation = $4 \times (-1) \times (-2) - (-1) + 4 \times (-2)$ 4 points

= $8+1-8$ 5 points

=16 points

Five, comprehensive questions (2 questions, Question 26 is worth 10 points, Question 27 is worth 10 points, full score 20 points)

26、S: (1) There were $200+13=213$ (cars) produced on Thursday.....2 points

(2) $7 \times 200 + (5-2-4+13-10+16-9)$

= $1400+9$

=1409 (Cars) A: This factory produced 1409 cars this entire week..... .6 points

(3) $16 - (-10) = 26$ (cars)

A: The most productive day had 26 more cars than the least productive day..... 8

points

(4) $60 \times 1400 + 15 \times 9 = 84135$ (dollars)

A: This worker was paid \$84135..... 10 points

27、S: (1) Point B: 22 points

(2) A moves right: $[-2 - (-6)] \div 2 = 2$ seconds

Then the number Point B arrived at after 2 seconds: $2 + 2 \times 2 = 6$

∴ A 、 B had a distance of: $6 - (-6) = 12$ 6 points

(3) (1) When B moves to the right of A and is 4 units away from point A

The time B passes by: $(12-4) \div 2=4$ seconds8 points

(2) When B moves to the left of A and is 4 units away from A

The time B passes by: $(12+4) \div 2=8$ seconds

∴After B uses 4 or 8 seconds, A and B are 4 units apart..... 10 points