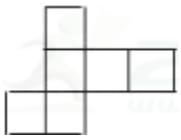
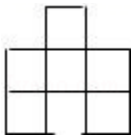
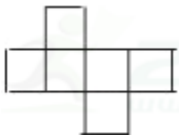
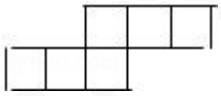
Mid-term Exam First Semester Mathematics 7th Grade 2017-2018 in Zhenjin School District, Jianyang City, Sichuan Province

(Time: 120 minutes, full score: 150 points)

Test A (full score 100 points)

One, multiple choice (3 points per question, full score 30 points)

1、Which of the following is not a net of a cube?（　　）

A.  B.  C.  D. 

2、 - 3 has an opposite value of（　　）

A. $-\frac{1}{3}$　　B. $\frac{1}{3}$　C. 3　D. - 3

3、Among the four numbers - 3， - 1，0，and 2, the least is（　　）

A. - 3 B. - 1 C. 0　D. 2

4、Which of the following 3D shapes can have a cross-sectional view that is circular?（　　）

A. Cube　　B. Cone　　C. Rectangular prism　D. Cylinder

5、Calculate（ - 3）+（ - 9）（　　）

A. 12　B. - 12　　C. 6　D. - 6

6、Out of the following, which one is correct?（　　）

A. $-|-5|=5$　B. $|-5|=5$　C. $-|-\frac{1}{2}|=\frac{1}{2}$ D. $|-0.5|=-\frac{1}{2}$

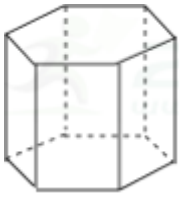
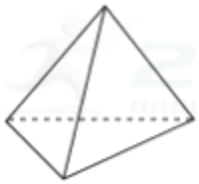
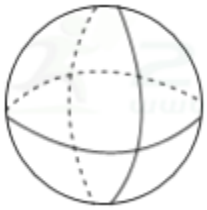
7、From the following algebraic expressions, which monomial has a degree of 3?（　　）

A. xy^2 B. x^3+y^3　　C. x^3y D. 3xy

8、Which of the following results would be negative?（　　）

A. $-(-2)^3$ B. -2^4　　C.（ - 1）×（ - 3）^{5}　D. $2^3\times(-2)^6$

9、Which one is a cylinder?（　　）

A.  B.  C.  D. 

10、When a= $-\frac{1}{2}$, algebraic expression $1-a^2$ has a value of（　　）

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

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

11、In the morning, the temperature was -3℃. By noon, the temperature has risen by 7℃. In the evening, it decreased 8℃. Therefore, the current temperature is____.

12. By observing the number line, use "＞" or "＜" to fill in the blank: a + c____0.

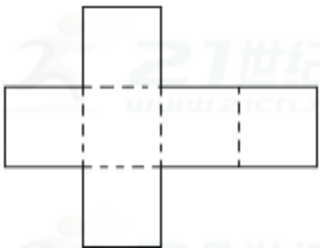
13. $-\frac{2x^3y}{5}$ has a coefficient of_____.

14. If polynomial $6x^{n+2}-x^2+2$ is a cubic trinomial with x as the variable, then n^2+1=____.

Three, calculation questions (full score 18 points)

15. Calculate: (1)　　(2) $-1^4-\frac{1}{6}\times[3-(-3)^2]$

16. The figure is a net figure of a cube. Fill in the numbers －6, , －1, 6, －and 1 into six small squares respectively, so that the two numbers on the opposite sides of the cube folded by the dotted line are mutually is the opposite number.



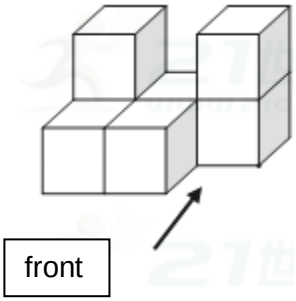
Four, short answer questions (full score 36 points)

17. (8 points) First simplify, then substitute , among them $x = 11$, $y = 16$.

18. (8 points) The following figure is formed from 7 identical cubes.

（1）Please sketch the three different views on the figure.

（2）What is the surface area? (One edge is 1 unit)



19. (10 pointso) The relationship between the remaining fuel quantity Q (kg) in the fuel tank and the driving time t (hours) when a car is running is as follows:

（1）Write down the algebraic formula that uses the time t to represent the remaining oil quantity Q; （2）When $t=2\frac{1}{2}$, find the value of Q;

（3）According to the algebraic expressions listed, how many kilograms of gasoline are in the tank before the car is driven?

（4）How many hours can the car run with the gasoline in the tank?

Travel time t/hour	Remaining oil Q/kg
1	48 - 6
2	48 - 12
3	48 - 18
4	48 - 24
5	48 - 30

20．(10 points) One afternoon, taxi driver William operated on a north-south road. If south is recorded as "+", north is recorded as "-". His driving conditions this afternoon are as follows: (unit: kilometers: there are passengers every time he travels)

－2，+5，－1，+10，－3，－2，－4，+6

Please answer:

（1）When William delivered the last passenger to his destination, what direction was William going? How far is it from the point he started in the morning, to the last afternoon departure?

（2）If it is stipulated that the starting price of each ride is 10 dollars, and each ride within 3 kilometers (including 3 kilometers) only charges the starting price; if it exceeds 3 kilometers, in addition to the starting price, every kilometer that exceeds 3 kilometers will be charged an extra 2 dollars. So how much is the total fare that William received from the passengers this afternoon?

（3）If William's taxi consumes 0.3 liters of fuel per kilometer and 6 dollars per liter of gasoline, excluding the loss of the car, is William making a profit or loss this afternoon? How much was the profit (or loss)?

Test B (full score 50 points)

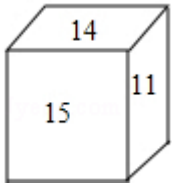
One, fill in the blanks (4 points per question, full score 20 points)

21. Order the numbers 3^2 , , 0 , $\left|-\frac{1}{2}\right|$, $-\frac{1}{10}$ from greatest to least:_____.

22. The new operation,*, works as follows: a*b=a^b. For example, 3*2=3^2=9. Then $(-\frac{1}{2})$*3=____ .

23. Algebraic expression $(a-2)m^2+(2b+1)mn-m+n-7$ is an expression with m and n as the variables. If this polynomial does not include squared monomials, then 3a+2b=____

24. As shown in the figure, six consecutive integers are marked on the six faces of the cube. If the sum of the numbers marked on the two opposite faces is equal, then the sum of these six numbers is_____.



25. Points A_1、A_2、A_3、…、A_n (n is a positive integer) are all on the number line. Point A_1 is left of origin O, and A_1O=1; Point A_2 is right of Point A_1, and A_2A_1=2; Point A_3 is left of A_2, and A_3A_2=3; Point A_4 is right of A_3, and A_4A_3=4；…，According to the same pattern above,

（1）The number point A_2 represents is_____；

（2）The number point A_{2015} represents is_____.

Two, short answer questions (full score 8 points)

26. During the "Ten • 1st" Golden Week, the daily number of tourists in Lakewell park during the 7-day holiday is as follows:

(positive sign means more people than the day before, negative sign means less than the day before)

Day	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Dah 7
Change in visitors unit: 10,000s	+1.8	- 0.6	+0.2	- 0.7	- 1.3	+0.5	- 2.4

（1）If the number of visitors on September 30 was 42,000, the number of visitors on October 4 was ____;

（2）Of the seven days, the day with the largest number of passengers was _____ people more than the day with the least number of tourists.

（3）If the economic income brought by every 10,000 people is about 1 million dollars, how much is the total tourism income of the seven-day Golden Week?

Three, (full score 10 points)

27. Given that $(x-3)^2+\left|y+\frac{1}{3}\right|=0$, find the value of $3x^2y-[2xy^2-2(xy-\frac{3}{2}x^2y)+3xy]+5xy^2$.

Four, short answer questions, (full score 12 points)

28. On the number line, point A represents -1. Point B represents 1. An insects crawls from B to a point four units away, Point C, and then back to Point A, using up four whole minutes.

(1)Find the number Point C represents;

(2) The insect returns to point A, and then makes the following movements: first, crawling 2 units to the right, second, crawling 4 units to the left, third, crawling 6 units to the right, and fourth, crawling to the left 8 units. If it continues traveling in this pattern, find the number corresponding to the point where it stopped for the 10th time;

(3) If the insect A returns to A and continues to crawl along the negative direction of the number axis at a speed of 4 units per second, then another insect B starts from point C and travels along the negative direction of the number axis at a speed of 7 units per second, let the points corresponding to insect A be point E, the point corresponding to insect B is point F, and the numbers corresponding to the points A, E, F, and B are respectively x_A, x_E, x_F, and x_B. When the movement time t does not exceed 1 second, then the following conclusions: ① $|x_A - x_E| + |x_E - x_F| - |x_F - x_B|$ is unchanged; ② $|x_A - x_E| - |x_E - x_F| + |x_F - x_B|$ is unchanged; only one of the conclusions is correct, please choose the correct conclusion and find its fixed value.

Answer Key

Test A

One, multiple choice (3 points per question, full score 30 points)

#	1	2	3	4	5	6	7	8	9	10
Ans.	B	C	A	B	B	B	A	B	A	B

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

11 · - 4 ℃ 12. < 13. $-\frac{2}{5}$ 14. 2

Three, calculation questions (full score 18 points)

15. (1)S: Original equation= - 8 + | - 3 | + (- 8) ----------3 points

= - 8 + 3 + (- 8) ----------4 points

= - 5 + (- 8) ----------5 points

= - 13----------6 points

(2)S: Original equation= $-1-\frac{1}{6}\times$ (3 - 9) ---------- ----2 points

= $-1-\frac{1}{6}\times$ (- 6) ----------4 points

= - 1 + 1----------5 points

=0----------6 points

16 ·

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

If there are multiple correct answers, two points are given to each of the students who got this right.

Four, short answer questions (full score 36 points)

17. (8 points) S: Original equation= $(x^2y-3x^2y+2x^2y)+(-6xy+5xy)$ -- ----3 points

$=-xy$ ----------6 points

When $x=11$ and $y=-6$

Original Equation= - 11× (- 6) ----------7 points

=66----------8 points

18. (8 points) S:（1）is as shown:

（Every face is 2 points）

（2）2×（5+3+5）+2=28---------- ----------2 points

19. (10 points)

S: (1) $Q=48-6t$ ----------2 points

(2) When $t = 2\frac{1}{2}$,

$Q = 48 - 6 \times 2\frac{1}{2}$ ----------3 points

=48 - 15----------4 points

=33----------5 points

(3) The car had 48 liters of gas before driving.---------- (6 points)

(4) 48 - 6t=0----------8 points

6t=48

t=8----------9 points

∴ The original gasoline in the tank can run the car for 8 hours ----------10 points

20. (10 points)

S: (1) - 2 + 5 + (- 1) + 10 + (- 3) + (- 2) + (- 4) + 6--------1 point

= - 2 - 1 - 3 - 2 - 4 + 5 + 10 + 6

= - 12 + 21

=9 (km) ---------- (2 points)

∴ William was in the south of the starting point in the afternoon, 9km away from the starting point ---------- (3 points)

(2) 10×8 + (5 - 3) ×2 + (10 - 3) ×2 + (4 - 3) ×2 + (6 - 3) ×2 --4 分)

=80 + 4 + 14 + 2 + 6

=106 (dollars) ---------- (5 points)

∴ William received a total of 106 dollars in fares from passengers this afternoon.---------- (6 points)

(3) | 1 - 2 | + | 5 | + | - 1 | + | 10 | + | - 3 | + | - 2 | + | - 4 | + | 6 | ×0.3×6-- (7 points)

=33×0.3×6

=59.4 (dollars) ---------- (8 points)

106 - 59.4=46.6 (dollars) ---------- (9 points)

∴ William made a profit of 46.6 dollars this afternoon.---------- (10 points)

Test B

One, fill in the blanks (4 points per question, full score 20 points)

#	21	22	23	24	25
Ans.	$3^2 > |-\frac{1}{2}| > 0 > -\frac{1}{10} > (-2)^3$	$-\frac{1}{8}$	5	81	1 · - 1008

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

26. S: (1) 4.9---------- (2 points)

(2) 4.3---------- (4 points)

(3) Week 1: 4.2 + 1.8=6 (10,000 people)

Week 2: 6 - 0.6=5.4 (10,000 people)

Week 3: 5.4 + 0.2=5.6 (10,000 people)

Week 4: 5.6 - 0.7=4.9 (10,000 people)

Week 5: 4.9 - 1.3=3.6 (10,000 people)

Week 6: 3.6 + 0.5=4.1 (10,000 people)

Week 7: 4.1 - 2.4=1.7 (10,000 people) ---------- (6 points)

∴ Total revenue is (6 + 5.4 + 5.6 + 4.9 + 3.6 + 4.1 + 1.7) ×100---------- (7 points)

=3130 (10,000 dollars) ---------- (8 points)

Three, calculation questions (full score 18 points)

27. S: ∵ $(x-3)^2 \geq 0, |y+\frac{1}{3}| \geq 0$ ---- (2 points)

And $(x-3)^2 + |y+\frac{1}{3}| = 0$ ---- (3 points)

$\therefore (x-3)^2 = 0 \cdot |y+\frac{1}{3}| = 0$

$\therefore x-3=0 \cdot y+\frac{1}{3}=0$

$\therefore x=3 \cdot y=-\frac{1}{3}$ ---------- (5 points)

又∵ Original equation $= 3x^2y-(2xy^2-2xy+3x^2y+3xy)+5xy^2$ --------- (6 points)

$= 3x^2y-2xy^2+2xy-3x^2y-3xy+5xy^2$ ---------- (7 points)

$= 3xy^2-xy$ ---------- (8 points)

∴ Original equation $= 3\times3\times(-\frac{1}{3})^2-3\times(-\frac{1}{3})$ ---------- (9 points)

$=9\times\frac{1}{9}+1$

=2---------- (10 points)

28. (12 points)

S: (1) $\frac{4\times4-2}{2}=7$,

$7+1=8$,, so point C represents 8; ———————— (3 points)

(2) $-1+2+(-4)+6+(-8)+10+(-12)+14+(-16)+18+(-20)=-11$,

That is, the number corresponding to the point where the tenth move is -11 ; ———————— (4 points)

(3)② $|xA-xE|-|xE-xF|+|xF-xB|$ doesn' t change, so choose -2;

Prove: $x_E<x_A<x_B<x_F$, so:②

$|x_A-x_E|-|x_E-x_F|+|x_F-x_B|=x_A-x_E+x_E-x_F+x_F-x_B=x_A-x_B=-1-1=-2$.

———————— (5 points)