# Kangaroo.Study

## GEP MATHS
## MODULE REVIEW

# Contents

# Word Problem

(1) Age problem

1. Tom's family went to visit his grandfather, who was very happy to see the clever Tom.  Tom is 11 years old, while Grandpa and Grandma are 73 and 69 years old respectively. So in how many years, the sum of Grandpa and Grandma's ages will be exactly 8 times that of Tom's.

Answer:_____

2. Huanhuan and Lele are two turtles. One day, Huanhuan said to Lele: "100 years ago, you were three times as old as I was; 100 years later, you will be 100 years older than me." So how old is Huanhuan .

Answer:_____

3. This year, small Dragon is 2020 years old and has caught a river demon (between 100 and 900 years old). If in 20 years, Xiao Long's age is 6 times that of the river demon, how old is the river demon this year.

Answer:_____

4. This year Alex is 8 years old and his father is 36 years old. When the sum of their ages is 62 years old, how old is Alex?

Answer:_____

(2) Chicken and rabbit problem

1. In a pond, there are 20 more swans than toads, and the swans and toads have a total of 100 legs, so how many toads are there.

Answer:_____

2. There are 20 bicycles and tricycles with a total of 54 wheels in the parking lot, so how many tricycles are there.

Answer:_____

3. The circle of friends can send a maximum of 9 pictures at a time. Li Ming wanted to send the photos of 24 students in the choir to his circle of friends. One photo of a boy is for two people, and one photo of a girl is for three people. As a result, 9 photos just show all 24 students. How many girls are in the choir .

Answer:_____

4. Chicken and rabbit in the same cage. There are 10 heads and 24 legs in total, so how many rabbits are there?

Answer:_____

(3) Average problem

1. Mom bought Alex 14 boxes of milk candies with 18 candies in each box, and bought Ben 19 boxes of fruit candies with 12 candies in each box. They decided to share the candy with 4 friends, and each of them got the same amount of candy, so how many candies can each of them get.

Answer:_____

2. Cindy 's grades for the five assignments this semester were 95, 87, 92, 100 and 96. What is the average score of Cindy 's 5 assignments?

Answer:_____

3. The average score of Alex's first 4 assignments is 90, and the score of his fifth assignment is 95. What is the average score of Alex 's first 5 assignments?

Answer:_____

4. When a group of students had their heights measured, they found that two of them were 123 cm tall and the other four were 132 cm tall. What is the average height of this group?

Answer:_____

(4) Sum, difference and multiple problem

1. Given a square, if one side increases by 10cm and the other side decreases by 5cm, then the length of the new rectangle is four times as long as its width, then how many cm is the width of the rectangle

Answer:_____

2. Alex likes doing math problems very much. Normally, he does two problems every day. But when he is happy, he will do three times the normal number. In May, he did 110 problems in total. Then how many days did he have in May

Answer:_____

3. Alex and Ben went together to help the teacher to move books, a total of 200 books, Alex moved 20 books more than twice as many as Ben, how many books did Ben move.

Answer:_____

4. The Nanjing Yangtze River Bridge is divided into two layers, the upper layer is a highway bridge, and the lower layer is a railway bridge. The railway bridge and the highway bridge are 11270 meters long. The railway bridge is 2270 meters longer than the highway bridge. How long is the highway bridge of the Nanjing Yangtze River Bridge?

Answer:_____

(5) Working backward problem

1. Every time Dad goes out to buy a mask, he has to consume one mask at home, and each time he buys a limit of 5 masks. If he gets them, he gets 4 more masks; if he doesn't get them, he loses 1 mask. There were 8 masks in the house, and dad went out to buy masks 11 times, so there are 17 masks in the house. How many times did Dad get the masks?

Answer:_____

2. Alex bought a toy and used half of the money he brought for 20 yuan more, and used half of the money left for 20 yuan less to buy a Muppet. If Alex has $200 left at the end, how much did he spend on the toy?

Answer:_____

3. Alex, Eric and Laura divided the peaches. Alex divided the peaches equally into 5 parts and took 3 of them; Eric divided the remaining peaches equally into 5 parts and took 3 of them; Laura got the remaining 4 peaches. There were a total of ( ) peaches.

A.30            B.15            C.20            D.25            E.10

Answer:_____

4. There are two piles of balls, A and B. There are more balls in pile A than in pile B, and the total number of balls is between 160 and 180. The first time you take out twice as many balls from pile A as from pile B and put them in pile B. The second time you take out twice as many balls from pile B as from pile A and put them in pile A. The third time you take out twice as many balls from pile A as from pile B and put them in pile B. After this operation, you find that the number of balls in piles A and B is equal after moving them three times. So how many small balls were in pile A at begin?

Answer:_____

5. There was a shipment of rice in the granary. The first shipment took half plus 3 tons. The second time half plus 5 tons were taken away. There are 4 tons left. How much rice was in the granary.

Answer:_____

## (6) Excess and shortage

1. The kindergarten teacher takes out apples and gives them to the children. If the apples are distributed equally to the children, there will be 4 less; if only 4 are given to each child, the teacher will be able to keep 4 for herself. How many children are there? How many apples are there?

Answer:_____

2. The teacher distributes a basket of apples to the children. If you give 5 apples to each student in the large class, there are 10 apples left over; if you give 8 apples to each student in the small class, there are 2 apples missing. How many apples are in this basket, knowing that there are 3 more students in the large class than in the small class?

Answer:_____

3. There are some fruits, If each person has 7, there is 1 more; if each person has 8, there are 16 less. There are a total of ( ) fruits.

A.17                    B.119                    C.180                    D.120

Answer:_____

4. Eric does a set of exercises. If he makes 1 question every 2 minutes, he will have 3 questions left at the end of the time limit; if he makes 2 questions every 3 minutes, he can finish the exercises 3 minutes earlier than the time limit, so how many questions in total are in the set of exercises.

Answer:_____

5. The students went boating, and they calculated that if each boat sat 20 people, there would be 20 more people; if each boat sat 21 people, there would be 21 less people. How many-people in the class.

Answer:_____

(7) Planting problem

1. Alex originally planned to install a street light every 50 meters from point A on a circular road with a perimeter of 400 meters, and each street light requires a hole to be dug with which to bury the lamp post.

　　According to the original plan, how many holes does Alex need to dig?

Answer:_____

2. A total of 90 trees are planted on one side of a road, including the ends, and the distance between each two trees is 5 m. What is the length of the road in meters?
　　A. 460　　　　B. 455　　　　C. 450　　　　D. 445　　　　E. 440

Answer:_____

3. On a road in a city, there are 14 stations from the starting station to the end station, and the average distance between each two stations is 1200 meters. How long is this road?

Answer:_____

4. There are 154 trees planted on one bank of a 612-meter-long canal. What is the distance between each adjacent two trees?

Answer:_____

5. A rectangular site is 300 meters long and 50 meters less wide than long. Starting from one corner of the rectangle, trees are planted along the perimeter of the rectangle, one tree every 10 meters. How many trees can be planted around this field?

Answer:_____

(8) Period problem

1. The musical fountain in the recreation square will start spraying water jets at 7:00 every night on time. If this fountain will rest for 4 minutes after each continuous jet of water for 4 minutes. How long did the fountain spray water between 7:00 and 8:00 in total?

Answer:_____

2. The New Year is coming soon, and Laura wants to save money to buy a gift for her mother through her own efforts. So she plans to save $2 a day, and every 10 days she will take a day off from saving, and spend $4 on a lollipop as a reward on the day she takes a break. So how many days does it take for Laura to save 80 dollars at least.

Answer:_____

3. Eric has to eat 3 meals a day, he eats 5 buns in the morning, 6 buns at noon and 4 buns at night. If he is given 200 buns before breakfast, how many meals can Eric eat.

Answer:_____

4. The Tokyo Olympics in 2020 will be the 32nd Summer Olympic Games. It is known that the Olympic Games are held once every four years, so which Olympic Games was the 2008 Olympics in China .

Answer:_____

5. On the calendar for December of a certain year, the number of days on the first Monday and the last Monday of the month add up to 33. What is the number of days on the first Friday and the last Friday of the month add up to?

Answer:_____

(9) Normalization problem

1. If you know that 3 plant shooters can take down 21 monsters in 7 minutes, how many monsters can be taken down by 6 plant shooters in 8 minutes.

Answer:_____

2. If 7 trucks take 84 tons of sand in 6 trips. Then how many tons can be transported by 8 trucks in 4 trips?

Answer:_____

3. If Cindy turns 240 laps in 3 minutes, according to this calculation, if he turns for 8 minutes, how many laps did he turn in total.

Answer:_____

4. If three people plant 18 trees in two hours, how many trees can one person plant in one hour?

Answer:_____

5. It takes 15 minutes to divide a piece of steel into 6 sections. At this speed, how many minutes does it take to divide it into 10 sections?

Answer:_____

# Calculation

(1) Clever calculation

1. Calculate: $63+184-147+116-253+137$.

A. 200          B. 100          C. 250          D. 300          E. 350

Answer:_____

2. Calculate: $363+194-347+106-263+147$.

A. 200          B. 100          C. 250          D. 300          E. 350

Answer:_____

3. Calculate: $194-247-144+263+147-213$.

A. 150          B. 100          C. 50          D. 0          E. 200

Answer:_____

4. Calculate: $4\times37\times25$.

Answer:_____

(2) Arithmetic sequence

1. Calculate: $2+4+6+\cdots+40$.

Answer:_____

2. Calculate: $(4+8+12+\cdots+60)-(3+7+11+\cdots+59)$.

Answer:_____

3. Calculate: $1+2+4+5+7+8+10+\cdots+58+59$.

Answer:_____

4. The sum of five consecutive odd numbers is 105, what is the second odd number?

Answer:_____

5. What is the sum of 20 consecutive odd numbers, the second odd number of which is 23?

Answer:_____

(3) Define new operations

1. If $a\triangle b=(a+b)\times b$, find the value of $4\triangle 6$.

A. 10          B. 40          C. 60          D. 24          E. 30

Answer:_____

2. If $a \odot b = a \times (b+2)$, find the value of $4 \otimes 6$.

A. 12      B. 36      C. 32      D. 24      E. 26

Answer:_____

3. If $a \odot b = (a+1) \times b$, find the value of $2 \odot 5 \odot 5$ in order from left to right.

A. 12      B. 50      C. 72      D. 80      E. 75

Answer:_____

4. Assume that $1 \odot 2 = 1 \times (2+2) = 4$, $2 \odot 3 = 2 \times (3+2) = 10$, $3 \odot 4 = 3 \times (4+2) = 18$. Find the value of $8 \odot 3$.

Answer:_____

5. Assume that $1 \odot 2 = \dfrac{1+2}{(1+1) \times 2} = \dfrac{3}{4}$, $2 \odot 3 = \dfrac{2+3}{(2+1) \times 3} = \dfrac{5}{9}$, $3 \odot 4 = \dfrac{3+4}{(3+1) \times 4} = \dfrac{7}{16}$. Find the value of $8 \odot 3$.

Answer:_____

6. If $a \odot b = a \times (b+2)$, $a \square b = (a+1) \times b$, find the value of $2 \odot 5 \square 2$ in order from left to right.

Answer:_____

(4) Fraction

1. Find the smallest number of $\dfrac{1}{3}, \dfrac{4}{9}, \dfrac{2}{9}, \dfrac{3}{8}, \dfrac{1}{4}$.

A. $\dfrac{1}{3}$      B. $\dfrac{4}{9}$      C. $\dfrac{2}{9}$      D. $\dfrac{3}{8}$      E. $\dfrac{1}{4}$
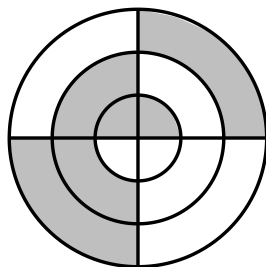
Answer:_____

2. Find the largest number of $\dfrac{1}{3}, \dfrac{4}{9}, \dfrac{2}{9}, \dfrac{3}{8}, \dfrac{1}{4}$.

A. $\dfrac{1}{3}$      B. $\dfrac{4}{9}$      C. $\dfrac{2}{9}$      D. $\dfrac{3}{8}$      E. $\dfrac{1}{4}$

Answer:_____

3. What fraction of the total figure is shaded?

A. $\dfrac{3}{4}$      B. $\dfrac{7}{12}$      C. $\dfrac{4}{9}$      D. $\dfrac{1}{2}$      E. $\dfrac{3}{5}$

Answer:_____

4. There are 20 students in the class and 8 boys, so what fraction of the girls are boys?

A. $\dfrac{2}{5}$    B. $\dfrac{3}{5}$    C. $\dfrac{3}{2}$    D. $\dfrac{2}{3}$    E. $\dfrac{3}{4}$

Answer:_____

5. After Eric cut down 14 trees, there were still $\dfrac{3}{5}$ left. So how many trees were there?

A.30    B.21    C.35    D.28    E. 42

Answer:_____

## (4) Equivalent substitution

1. 9 peaches can be exchanged for 3 pineapples, 2 watermelons can be exchanged for 8 pineapples and 2 peaches, how many peaches can be exchanged for 5 watermelons?
A. 60        B. 62        C. 65        D. 67        E. 70

Answer:_____

2. A cow eats the same weight of grass in one day as two rabbit eats in nine days, and the same weight of grass as six sheep eat in a day. Given that a cow eats 18 kg of grass a day, how much grass do a rabbit and a sheep eat in a day?
A. 3        B. 4        C. 5        D. 6        E. 7

Answer:_____

3. The length of the wall built by Kat in 2 days is equal to the length of the wall built by Jerry in 3 days, and the length of the wall built by Jerry in 5 days is equal to the length of the wall built by Eric in 7 days. If a wall takes 10 days for Kat to finish, how many days does Eric need?
A. 30        B. 20        C. 21        D. 24        E. 27

Answer:_____

# Number theory

1. A, B and C are climbing Mt. C asks A and B about their current positions. A says that he has climbed 37 more steps than the remaining steps, and B says that he has climbed 4 fewer steps than the remaining steps. It is known that C has correctly calculated that the steps he has climbed are 34 steps less than the remaining steps. Q: Can C be sure which of A and B must be wrong?

<div align="right">Answer:_____</div>

2. Is the sum of $1987+1989+1991+1993+\cdots+2135$ an odd or an even number.

<div align="right">Answer:_____</div>

3. The sum of the products of the seven numbers from 3 to 9, multiplied by two, is an odd or even number

<div align="right">Answer:_____</div>

# Counting

(1) Enumeration method

1. How many ways are there to divide 6 pieces of candy among three people, each of whom gets at least one candy?

<div align="right">Answer:_____</div>

2. How many ways are there to choose three people from among two boys and three girls, with at least one girl among those chosen?

<div align="right">Answer:_____</div>

3. How many different two-digit numbers can be formed from 9 different digit cards (without the

digit 0)?

Answer:_____

4. How many four-digit numbers without repeating digits can be formed from 1, 2, 3, 4, and 5?

Answer:_____

5. Knowing that the sum of three different natural numbers is 10, how many possibilities there are for these three natural numbers.

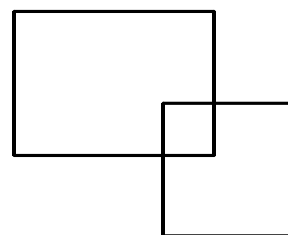Answer:_____

(2) Inclusions and Exclusions

1. In the fifth grade, there are 28 students in the math interest group, 24 students in the language interest group, and 12 students in both. What is the total number of 5th graders in the interest group?

Answer:_____

2. The area of a rectangle is 78, the area of a square is 62, and the area of the overlap is 15. What is the area of this combined figure?

Answer:_____

3. A total of 50 people in the class are taking piano and violin lessons, of which 39 are taking piano lessons and 27 are taking violin lessons. How many people have studied both?

Answer:_____

4.There are 52 students in a class. 28 students are in the Chinese group, 32 students are in the Math

group, and 15 students are in both groups. how many people did not participate in either group?

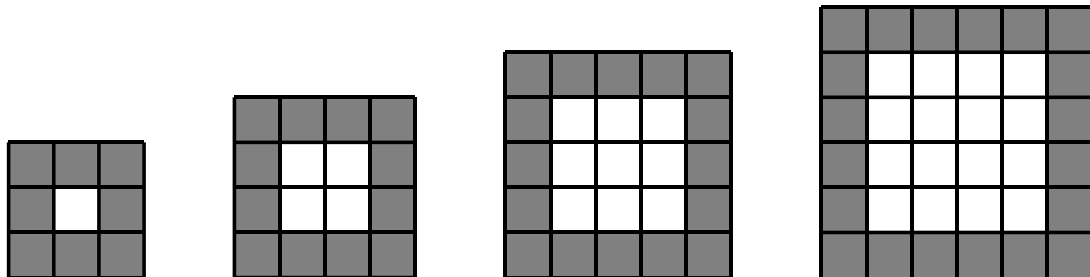Answer:_____

# Comprehensive problem

(1) Find the pattern

1. Find the pattern and fill in the blanks

  (1) 1，3，5，7，9，11，_____，_____，17……;

  (2) 1，2，4，8，16，_____，_____，128……;

  (3) 1，1，2，3，5，8，13，21，_____，55……

  (4) 1，4，9，16，25，36，_____，_____，81…… .

2. Arrange the triangles with rods according to the following pattern ,The number of small triangles in the sixth figure is _____



3. As shown in the figure, two square tiles of the same size, black and white, are used to lay a square floor, when the black tiles are 24, the white tiles are _____ .



(2) Logical reasoning

1. After Mr. Chen told A, B and C one number each, the four of them had the following conversation in turn.

Teacher Chen said, "These three numbers are different natural numbers from 1 to 9, and C's number is exactly the average of A's and B's numbers.

A says, "I guess C's number is 7."

B says, "C's number can't be 7."

C said, "It's true that it's not 7, but I still don't know the number of both of you．"

Mr. Chen said, "I'll give A and B a hint, C's number is not 6 either, can you know C's

Can you tell C's number?"

A and B say at the same time, "I still don't know C's number."

C says, "Well, now I know both of your numbers."

Suppose they are all smart and honest enough, and A, B, and C take the numbers A, B, and C in that order, then the three-digit number is _____.

2. The teacher told Tao, Zhang, and Ning the values of three non-zero natural numbers A, B, and C. Each student did not know how many values the other two had, but only knew that A+B+C=13. Among the three students, the following conversation took place:

Tao: "These three numbers must be different from each other!"

Zhang: "I can't guess your numbers."

Ning: "I couldn't guess either, but when I said that, I knew what your number was."

All three students are smart enough and never lie, so $A \times B \times C = $ _____.

3. A robot was developed by a doctor．As long as it is connected to the network, everything it says is right．Once it is disconnected from the network, everything it says is wrong． Now A says: "There is only one of us connected to the network"．B says: "A is wrong． C says, "At least one of us is not connected to the network." D says, "I found out that A is connected to the network. Among the four robots, there are several that are not connected to the network．

Answer:_____

4. In a math competition, the top five students were A, B, C, D and E. The teacher said to them, "Congratulations, please guess the ranking．"

A: "B is the second place and C is the fifth place．"

B: "D is the second place, E is the fourth place．"

C: "E is the first place, A is the fifth place．"

D: "C is second and B is third．"

E: "D is the third place and A is the fourth place．"

The teacher said, "You didn't tie for first place, but each of you guessed half correctly．" Can you tell their rankings?

Answer:_____

# Distance problem

1. Wang Liang goes to the Math Culture Festival. If he takes a car to and from the event, it will take him 72 minutes on the way; if he takes a car when he goes and walks when he comes back, it will take him 120 minutes on the way. If Wang Liang walks to and from the event, the journey will take _____ minutes.

Answer:_____

2. A small koala wants to climb a tree of 16 meters high, it can climb 4 meters every 8 minutes, but then it has to rest for 3 minutes, and during the rest time the koala slides down 2 meters. If this continues, the little koala can climb from the ground to the top of the tree in__minutes.
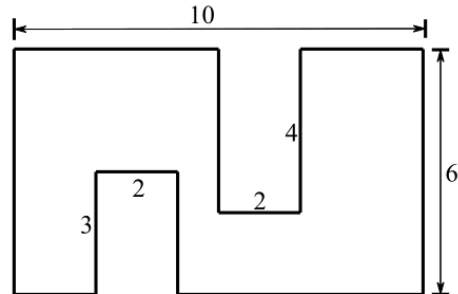
Answer:_____

3. As shown in the figure, two ants, A and B, crawl along a path that is always 1 meter wide on both sides. A crawls along the solid line at the top of the diagram from A to C. B crawls along the solid line at the bottom of the diagram from B to D. Then A crawls more __meters than B.
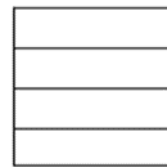
Answer:_____

# Geometry

## (1) Area

1. Calculate the area of the figure below



Answer:_____

2. As shown in the figure, a square is divided into four identical rectangles, each of which has a perimeter of 20 cm. What is the area of this square-?



Answer:_____

3. As shown in the figure, a rectangle with a perimeter of 30 cm is divided into a square and a smaller rectangle using a line segment. If the perimeter of the smaller rectangle is 16 cm. what is the area of the original rectangle.



Answer:_____

## (2) Perimeter

1. The area of a square is equal to the area of a rectangle. If the length of the rectangle is 1024 and the width is 1, what is the perimeter of the square?

Answer:_____

2. What is the perimeter of two rectangles, 4 cm long and 2 cm wide, put together (without

overlapping each other) to form a new rectangle?

Answer:_____

3. There is a square and a rectangle. The perimeter of the rectangle is 4 cm longer than the perimeter of the square, and the width is 2 cm less than the side of the square, so how many cm longer than the side of the square?

Answer:_____

4. What is the perimeter of a rectangle whose area increases by 114 square centimeters if its length and width increase by 6 centimeters at the same time?

Answer:_____