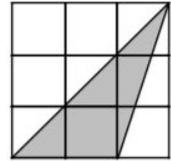**Question One**

You overtake the person coming 3rd in a race. You are then overtaken by exactly five people, without overtaking anyone else. How many people would you now need to overtake to be in first?

Question Two

In the diagram, each small square has a perimeter of 32cm. Find the area of the shaded region, in square centimetres.

Question Three

Three playing cards are placed in a row. The club is to the right of the heart and the diamond. The 5 is to the left of the heart. The 8 is to the right of the 4. List the cards in order from left to right.

Question Four

A fence 120 metres long is to be built with a post every 12 metres. If each end post takes 30 minutes to put in and every other post takes 20 minutes, how long does it take to put posts in for the whole fence?

Question Five

In the diagram, each of the five boxes is to contain a number. Each number in a shaded box must be the average of the number in the box to the left of it and the number in the box to the right of it. What is the value of x?

| 10			31	x

Question Six

In an election, Hemi received 60% of the votes and Junlin received all the rest. If Hemi won by 24 votes, how many people voted for Junlin?

Question Seven

The time on a digital clock is 5:55. How many minutes will pass before the clock next shows a time with all digits identical?

Question Eight

In the diagram beginning at the 2 a path must be followed downwards along the arrows to reach a 7. How many different paths make "2017" when following the direction of the arrows?
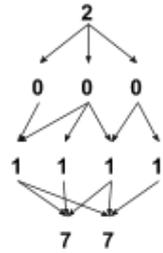

Question Nine

If 25% of the people who were sitting stand up, and 25% of the people who were standing sit down, then 70% of the people are standing. What percentage of the people were standing initially?

Question Ten

At the beginning of the game "Clock 7", the arrow points to one of the seven numbers. On each turn, the arrow is rotated clockwise by the number of spaces indicated by the arrow at the beginning of the turn. For example, if "Clock 7" starts with the arrow pointing at 4, then on the first turn, the arrow is rotated clockwise 4 spaces so that it now points at 1. The arrow will then move 1 space on the next turn, and so on. If the arrow points at 6 after the 2017th turn, at which number did the arrow point before the first turn?
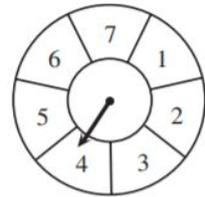
Question Eleven

Four balls numbered **1**, **2**, **3** and **4** are placed in a bag. A ball is drawn from the bag and the number is recorded. The ball is returned to the bag. After this has been done three times, what is the probability (**as a fraction**) that the sum of the three recorded numbers is more than 10?

Question Twelve

Any four of the whole numbers from 1- 6 may be used in the following expression once only $a^b \div \frac{c}{d}$. What is the largest possible result?

Question Thirteen

A deck of 100 cards is numbered from 1 to 100. Each card has the same number printed on both sides. One side of each card is red and the other side is yellow. Oliver places all the cards, red side up, on a table. He first turns over every card that has a number divisible by 2. He then examines all the cards, and turns over every card that has a number divisible by 3. He continues this with all numbers divisible by 4, then divisible by 5 … all the way through to 100. How many cards end up being red side up?

Question One

Clearly, $\frac{23}{30} = \frac{57}{78}$ is incorrect. However, if the same positive integer is subtracted from each of 23, 30, 57 and 78, then it will be correct. What is the number to be subtracted?

Question Two

Five students hang their identical school blazers on adjacent pegs. Later the blazers fall off and a teacher replaces them. What is the probability that when the owners reclaim their blazers only four of them get the correct blazer?

Question Three

How many multiples of 17 are there between 2017 and 3017?

Question Four

In a bank, Bava, Juan and Suren hold a distinct position of director (D), manager (M) and teller (T). The teller, who is the only child in his family, earns the least. Suren, who is married to Bava's sister, earns more than the manager. What position does Juan hold? Give your answer as D, M or T.

Question Five

ABCD is the rectangle where AB = 12 cm and BC = 5 cm. E is a point on the opposite side of AB to C, as shown in the diagram to the right. The lengths AE and BE are the same and the area of triangle AEB is 36 cm².
Find the area, in cm², of triangle AEC.
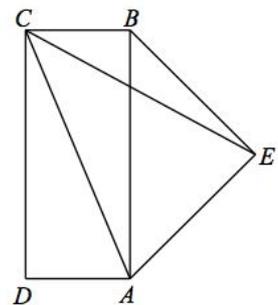
Question Six
At a secondary school, the number of students taking Maths and English is 45. The number of students who take neither is 23. The number of students who take Maths (and may or may not also take English) is 67. The number of students who take only one of these two subjects is 60. How many students do not take Maths?

Question Seven
A ten litre container of orange juice has 4 litres of juice removed and is filled up with water and mixed thoroughly. It then has 4 litres of the mixture removed again and filled up with water and mixed thoroughly. What percentage of the final mixture is orange juice?
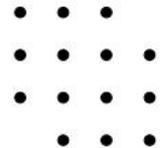
Question Eight
A circle is inscribed in trapezium PQRS. If PS = QR = 25cm, PQ = 18cm and SR = 32cm, what is the length of the radius of the circle?
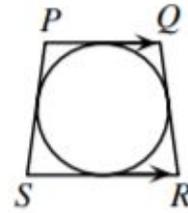
Question Nine
Two opposite corner dots from a 4 × 4 array have been removed, as shown in the diagram below. How many different squares (of any size) can be formed using four of these 14 dots as vertices?
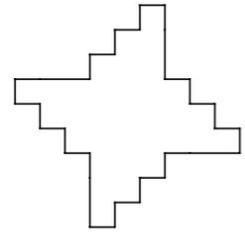

Question Ten
A hat is put on the head of each of 33 children. Each hat is red, yellow or blue. The teacher notices there are three times as many red hats as blue and twice as many red hats as yellow. If a student is chosen at random, what is the probability their hat is yellow (as a fraction)?

Question Eleven

In the diagram adjacent edges are at right angles. The four longer edges are equal in length, and all of the shorter edges are also equal in length. The area of the shape is 825cm^2. What is the perimeter?

Question Twelve

Can you guess this number?
- The number is not an odd number.
- It has exactly four factors.
- If you reverse the digits, a prime number is formed.
- The sum of the digits is a two digit prime number.
- The number is less than the square root of 10^4.
- One of the digits is a square number.

Question Thirteen

A digital clock shows the time 20:17. What would the smallest angle between the hour and minute hand on an analogue clock be at the same time?