MOCK TEST 2

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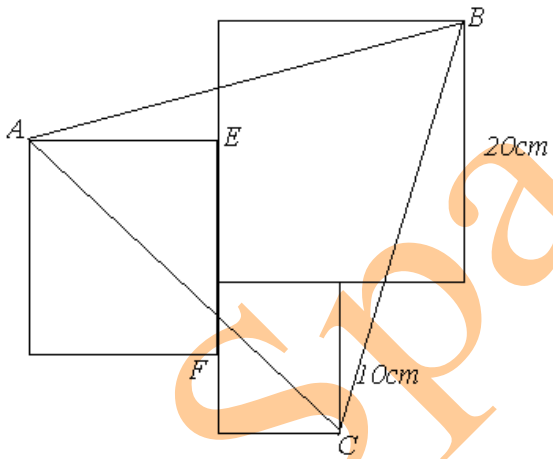
Duration: 120 minutes – No calculator used.

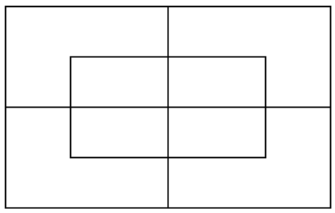
P1. Find the value of 999999 x 222222 + 333333 x 333334 = ?

P2. In below figure, there are 3 squares. E, F are midpoint of 2 squares of 20cm side, 10 cm side respectively.
Find the area of triangle ABC, in cm^2.



P3. Peter is ill. He has to take medicine A every 8 hours, medicine B every 5 hours and medicine C every 10 hours. If he took all three medicines at 7.am on Tuesday, when will he take them together again?

P4. Different rectangles can be traced using the line in the figure given at the right. How many different rectangles can be traced?



P5. The four-digit number $\overline{3AA1}$ is divisible by 9. What digit does A represent?

P6. X and Y are two different numbers selected from the first 40 counting numbers from 1 to 40 inclusive. What is the largest value that $\frac{X+Y}{X-Y}$ can have?

P7. Six arrows land on the target shown at the below figure. Each arrow is in one of the regions of the target. Which of the following total score is possible: 16, 19, 26, 31,

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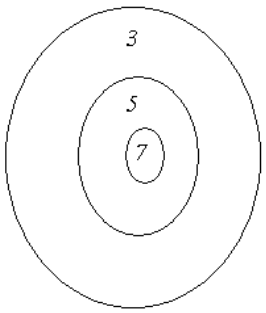
41, 44?



P8. The result of multiplying a counting number by itself is a square number. For example, 1, 4, 9, and 16 are each square numbers because 1 x 1 = 1, 2 x 2 = 4, 3 x 3 = 9, 4 x 4 = 16. What year in the 20th century (the years 1901 throught 2000) was a square number?

P9. John and Mary went to a book shop and bought some exercise books. They had $100 each. John could buy 7 large and 4 small ones. Mary could buy 5 large and 6 small ones and had $5 left. How much was a small exercise book?

P10. Given that $A^4 = 75600 \times B$. If A and B are positive integers, find the smallest value of B.

P11. Suppose five days after the day before yesterday is Friday. What of the week will tomorrow then be?

P12. A box contains over 100 marbles. The marbles can be divided into equal shares among 6, 7 or 8 children with 1 marbles left over each time.
What is the least number of marbles that the box can contain?

P13. Integer numbers are filled in a square grid in a pattern as shown at below figure. Which column and which row contain number 2015?

1	2	9	10	25		
4	3	8	11	24		
5	6	7	12	23		
16	15	14	13	22		
17	18	19	20	21		

P14. Square ABCD, shown here, has side length 8 units and is divided into four congruent squares. One of these squares contains an inscribed circle, two other squares contain diagonals and the fourth square has perpendicular line segments drawn from the midpoints of adjacent sides to form a square in the interior. In square units, what is the total area of the shaded regions? Express your answer in terms of π.

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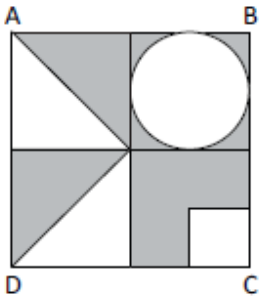
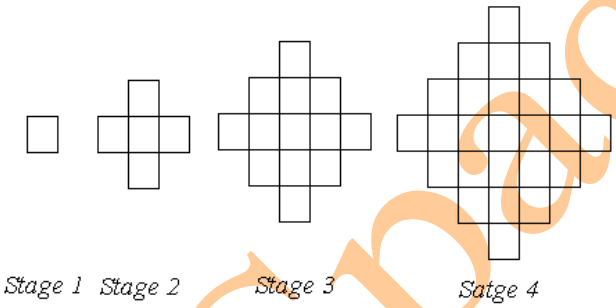


P15. At each Stage, a new square is drawn on each side of the primeter of the figure in the previous stage. How many unit squares will be in Stage 10?



P16. Find the smallest value of x + y + z, where x, y and z are different positive integers that satisfy this equation: $\frac{1}{x}+\frac{1}{y}+\frac{1}{z}=\frac{7}{10}$

P17. 40% of girls and 50% of boys in a class got 'A'. If there are only 12 students in the class got 'A's and the ratio of boys and girls in the class is 4:5. How many student are there in the class?

P18. Find the value of:

$$T=\frac{1}{1\times 2}+\frac{5}{2\times 3}+\frac{11}{3\times 4}+\ldots+\frac{89}{9\times 10}$$

P19. (1, 1, 9) is a triple of counting numbers whose sum is 11. We consider (1, 1, 9), (1, 9, 1) and (9, 1, 1) to be the same triple because each triple has the same three numbers. How many other triples of counting numbers have a sum of 11? (Counting number is greater than zero)

P20. In the addition problem at the right, different letters represent different digits. It is also given that N is 6 and T is greater than 1. What four-digit number does THIS represent?

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$$\begin{array}{r} T\ H\ I\ S \\ +\quad\ I\ S \\ \hline K\ E\ E\ N \end{array}$$

P21. How many four-digit integers greater than 5000 are there for which the thousands digits equals the sum of the other three digits?

P22. During the rest hour, one of five students (A, B, C, D and E) dropped a glass of water. The following are the responses of the children when the teacher questioned them:

A: It was B or C dropped it.

B: Neither E nor I did it.

C: Both A and B are lying.

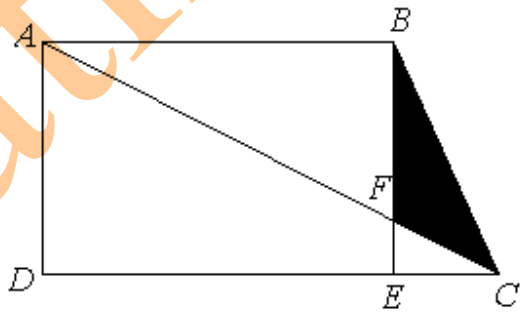
D: Only one of A or B is telling the truth.

E: D is not speaking the truth.

The class teacher knows that three of them NEVER lie while the other two ALWAYS lie.

Who dropped the glass?

P23. As shown in the figure, ABCD is a right trapezoid. AB = 10cm, AD = 6cm. The shaded area is $6cm^2$. What is the number of square centimeters in the area of trapezoid ABCD?



P24. Let *a, b, c, d, e* are integers satisfying the following expression:

$$\frac{501}{2015}=\frac{1}{a+\dfrac{1}{b+\dfrac{1}{c+\dfrac{1}{d+\dfrac{1}{e}}}}}$$

Find the value of a + b + c + d + e?

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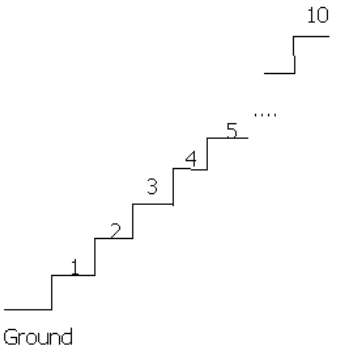
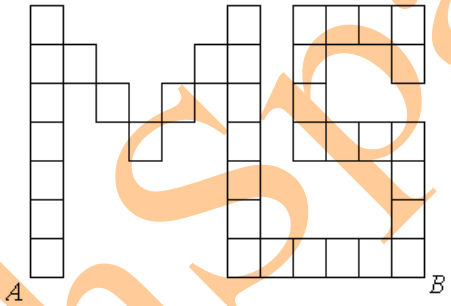
P25. The sum of 10 positive integers, not necessarily distinct, is 1001. If d is the greatest common divisor of the 10 numbers, find the maximum value of d?

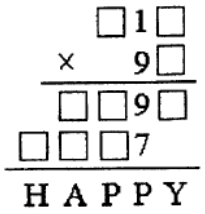
P26. A staircase has 10 steps. If Peter can climb either 1 or 2 or 3 steps each time, in how many ways can he reach the tenth step?



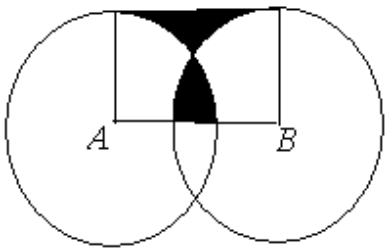
P27. How many shortest ways to go from A to B in below figure?



P28. In the multiplication on the right, each letter and each square represents a single digit. Different letters represent different digit but a square can represent any digit. What is the five-digit number "HAPPY" stands for?



P29. As shown in the figure, two circles have the same radius of 2cm. The two shaded regions have the same area. What is the length of AB in centimeters? (A, B are center of two circles respectively)



P30. The sum of several positive integers is 20. Find the largest product can be formed by these integers.

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