Division **P** Year 5

MATHS OLYMPIAD 2017 CONTEST

1 Altogether, there are 240 books owned by 4 children. If A gives B 3 books, B gives C 4 books, C gives D 5 books and D gives A 6 books. Then each has the same number of books. Initially, how many books belong to the child with the least number of books?

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2 Zachary has a computer program which accepts an input and produces an output.
Some of the data are shown in the table below.?

Input	1	2	3	4	5	6	7
Output	4	7	10	13	16	?	22

What is the output when the input is 6

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3 In an art class, the teacher presented shaped patterns. What is the 99th patterns if she continued drawing?

■ ▲ ● ★ ■ ▲ ● ★ ■ ●... ...

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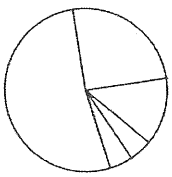
4 Hanna divides a circular piece of paper into 5 regions as shown in the diagram. She wants to paint each region using a color so that two regions sharing a common side with different colors.
What is the smallest number of colors she needs?



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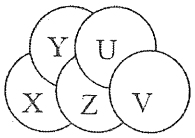
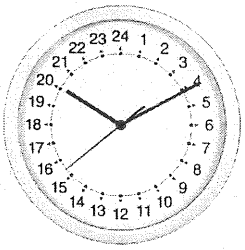
5 If we copy the letters "MATHS" repeatedly, we get "MATHSMATHS. . . ".
What is the 2017-th letter from the left?

6 The given diagram shows five differently coloured disks. The orange disk is above the green disk but below all the others. The purple disk is above the blue disk but below the red disk.

What is the colour of the disk labeled Z?



7 Alina's grandfather, a watchmaker, gives her a special watch.The long hand makes one revolution per hour, and the short hand makes one revolution per 24 hours. When Alina's favorite television show starts, the positions of the two hands are as shown. At this moment, what is the standard time?



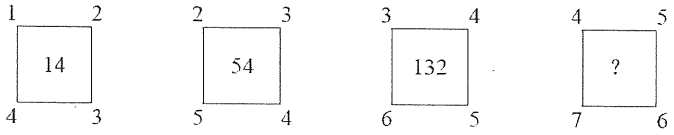
8 Wendy throws two cubical dice, with the numbers 1, 2, 3, 4, 5 and 6 on the faces. She records the product of the numbers appearing at the top of each die as the result of the attempt. What is the probability that the result of any attempt is an even integer?

9 In the mathematical sentence below, A, B, C, D, E and F represent six distinct digits from 0 to 9. What is the numeral value of E?

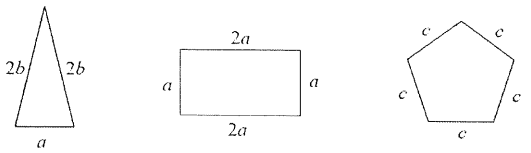
$$\begin{array}{rcccc} & & & 6 & A \\ \times & & & 3 & 5 \\ \hline & & 3 & 3 & B \\ & 1 & C & 8 & \\ \hline & D & E & F & B \end{array}$$

10 For every \$4 Jessica spends, May spends \$7. May spends \$ 120 more than Jessica does. How much does May spend?

11 The diagram below shows four squares with numbers which exhibit a certain pattern. What number should be inside the fourth box?



12 The three figures in the diagram below have equal perimeters. What is a: b: c ?



13 A triangle is formed with 10 matchsticks of equal length connected end to end?
How many different triangles can be formed?

14 The total weight of 5 apples is equal to that of 6 bananas, and the total weight of 3 bananas is equal to that of 4 oranges. How many apples have the same total weight as 16 oranges?

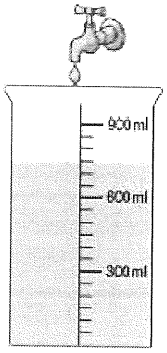
15 In each turn of a certain game, only the following point-scores are possible: 5, 3, 2, 0. Eight turns are taken. In how many ways can the total point-score be 25?

16 The two stars in the diagram represent the same number. The sum of the three numbers in the second row is equal to twice the sum of the three numbers in the first row. What number does each star represent

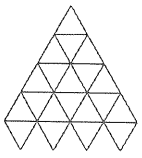
5	6	☆		
		☆	19	20

17 A sack of flour costs 800 dollars and a sack of rice costs 500 dollars. Anne buys several sacks of each kind and spends 3400 dollars. How many sacks of flour does she buy?

18 The tap is leaking at the rate of one drop per second. The volume of each drop is 0.05 ml. At 9 pm, Wendy puts an empty measuring cup under the tap. Some time during the night, she finds the cup partially filled, as shown in the diagram. No water is lost from the cup.
At what time is the water level in the measuring cup as shown?

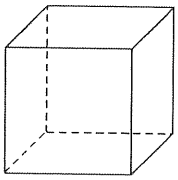


19 The figure in the diagram is formed from 20 equilateral triangles of equal sizes. How many equilateral triangles of any size does it contain? The triangles may overlap.



20 Some cards are missing from a deck of 52 cards. If the incomplete deck is dealt to four players so that each receives the same number of cards, then 3 cards are left. If it is dealt to three players instead, with each still receiving the same number of cards, then 1 card is left.
What is the maximum number of cards are there in the incomplete deck.

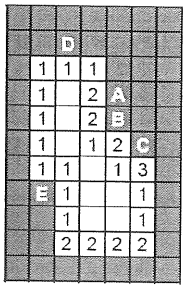
21 The six faces of a cubical die are labelled with six different positive integers. If the numbers on any two adjacent faces differ by at least 2, what is the minimum value of the sum of these six numbers?



22 For the class photo of 42 students, the photo shop charges 10 dollars for the first copy and 3 dollars for each additional copy. Moreover, 2 bonus copies are given for any order over 30 copies. If each student gets one copy, how many dollars must they pay the photo shop altogether?

23 Let △, □ and ☆ represent three distinct digits. If 7△90901 is larger than 79□9001, which is in turn larger than 798900☆, what is the value of △ + □ +☆?

24 In the given diagram shows the playing area of a video game Minesweepers. The blank squares and the squares with numbers contain no mines. A shaded square may contain a mine. The number on a square indicates the total number of mines in the eight squares sharing a common edge or vertex with that square. List down the alphabet(s) among the squares A, B, C, D and E containing mine(s)?



25 How many pairs of unit squares in a 3 by 6 table are such that they have no common points? The diagram shows one such pair?