3 point problems

1. My umbrella has KANGAROO written on top, as shown in the picture on the right. One

of the following pictures also shows my umbrella. Which one?
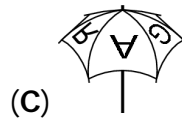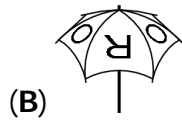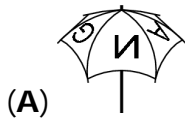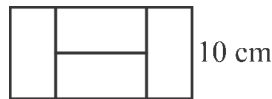
(**A**)   (**B**)   (**C**)   (**D**)   (**E**)
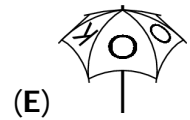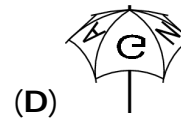
2. Four identical small rectangles are put together to form a large rectangle as shown. The length of the shorter side of the large rectangle is 10 cm. What is the length of the longer side of the large rectangle?

10 cm

(**A**) 10 cm   (**B**) 20 cm   (**C**) 30 cm   (**D**) 40 cm   (**E**) 50 cm

3. Which of the following numbers is closest to 2.015×510.2 ?

(**A**) 0.1   (**B**) 1   (**C**) 10   (**D**) 100   (**E**) 1000

4. The net of a cube with numbered faces is shown in the diagram.
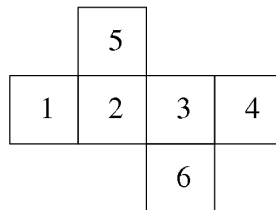
Sasha correctly adds the numbers on opposite faces of this cube. What three totals does Sasha get?

(**A**) 4, 6, 11   (**B**) 4, 5, 12   (**C**) 5, 6, 10   (**D**) 5, 7, 9   (**E**) 5, 8, 8

5. Which of the following numbers is not an integer?

(**A**) $\frac{2011}{1}$ (**B**) $\frac{2012}{2}$ (**C**) $\frac{2013}{3}$ (**D**) $\frac{2014}{4}$ (**E**) $\frac{2015}{5}$

**6.** A journey from Koice to Poprad through Preov lasts 130 minutes. The part of the journey from Koice to Preov lasts 35 minutes. How long does the part of the journey from Preov to Poprad last?

(**A**) 95 minutes   (**B**) 105 minutes   (**C**) 115 minutes
(**D**) 165 minutes   (**E**) 175 minutes

7. The diagram shows the net of a triangular prism. Which edge coincides with edge UV when the net is folded to make the prism?
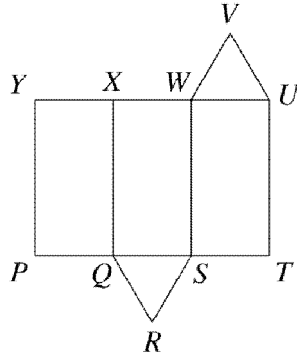
(**A**) WV (**B**) XW (**C**) XY (**D**) QR (**E**) RS

8. A triangle has sides of lengths 6, 10 and 11. An equilateral triangle has the same perimeter. What is the side length of the equilateral triangle?

(**A**) 18   (**B**) 11   (**C**) 10   (**D**) 9   (**E**) 6

9. When Simon the squirrel comes down to the ground, he never goes further than 5 m from the trunk of his tree. However, he also stays at least 5 m away from the doghouse. Which of the following pictures most accurately shows the shape of the region on the ground where Simon might go?
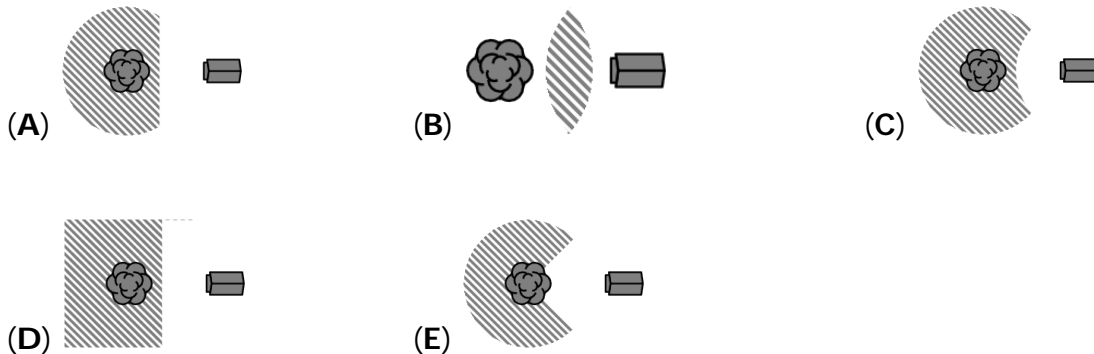
10. A cyclist rides at 5 m per second. The wheels of his bicycle have a circumference of 125 cm. How many complete turns does each wheel make in 5 seconds?

(**A**) 4   (**B**) 5   (**C**) 10   (**D**) 20   (**E**) 25

4 point problems

11. In a class, no two boys were born on the same day of the week and no two girls were born in the same month. Were a new boy or a new girl to join this class, one of these two conditions would no longer be true. How many children are there in the class?

(**A**) 18   (**B**) 19   (**C**) 20   (**D**) 24   (**E**) 25

12. In the diagram, the centre of the top square is directly above the common edge of the lower two squares. Each square has sides of length 1. What is the area of the shaded region?
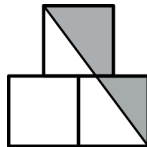
(**A**) $\frac{3}{4}$ (**B**) $\frac{7}{8}$ (**C**) 1   (**D**) $1\frac{1}{4}$ (**E**) $1\frac{1}{2}$

13. Every asterisk in the equation $2 * 0 * 1 * 5 * 2 * 0 * 1 * 5 * 2 * 0 * 1 * 5 = 0$ is to be replaced with either $+$ or $-$ so that the equation is correct. What is the smallest number of asterisks that must be replaced with $+$?

(**A**) 1   (**B**) 2   (**C**) 3   (**D**) 4   (**E**) 5

14. During a rainstorm, 15 litres of water fell per square metre. By how much did the water level rise in an open-air pool?

(**A**) 150 cm   (**B**) 0.15 cm   (**C**) 15 cm   (**D**) 1.5 cm
(**E**) It depends upon the size of the pool.

15. A bush has 10 branches. Each branch has either 5 leaves only or 2 leaves and 1 flower. Which of the following could be the total number of leaves the bush has?

(**A**) 45   (**B**) 39   (**C**) 37   (**D**) 31
(**E**) None of (A) to (D).

16. The mean score of the students who took a mathematics test was 6. Exactly 60% of the students passed the test. The mean score of the students who passed the test was 8. What was the mean score of the students who failed the test?

(**A**) 1   (**B**) 2   (**C**) 3   (**D**) 4   (**E**) 5

17. One corner of a square is folded to its centre to form an irregular pentagon. The areas of the pentagon and of the square are consecutive integers. What is the area of the square?
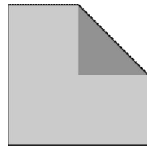
(**A**) 2   (**B**) 4   (**C**) 8   (**D**) 16   (**E**) 32

18. Rachel added the lengths of three sides of a rectangle and got 44 cm. Heather added the lengths of three sides of the same rectangle and got 40 cm. What is the perimeter of the rectangle?

(**A**) 42 cm   (**B**) 56 cm   (**C**) 64 cm   (**D**) 84 cm   (**E**) 112 cm

19. The diagram indicates the colours of some unit segments of a pattern. Luis wants to colour each remaining unit segment in the pattern either red or blue or green. Each triangle must have one side of every colour. What colour can he use for the segment marked x?
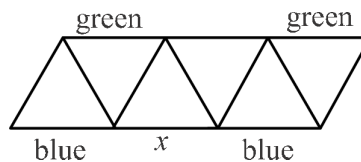
(**A**) only green   (**B**) only red   (**C**) only blue
(**D**) either red or blue   (**E**) The task is impossible.

20. Irina asked five of her students how many of the five of them had studied the day before. Pol said none, Berta said only one, Ona said exactly two, Eugeni said exactly three and Gerard said exactly four. Irina knew that those students who had not studied were not telling the truth, but those who had studied were telling the truth. How many of these students had studied the day before?

(**A**) 0   (**B**) 1   (**C**) 2   (**D**) 3   (**E**) 4

5 point problems

21. Ria wants to write a number in each of the seven bounded regions in the diagram. Two regions are neighbours if they share part of their boundary. The number in each region is to be the sum of the numbers in all its neighbours. Ria has already written in two of the numbers, as shown. What number must she write in the central region?
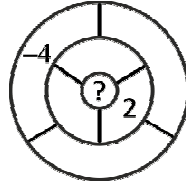

(**A**) 1   (**B**) −2   (**C**) 6   (**D**) −4   (**E**) 0

22. Five positive integers (not necessarily all different) are written on five cards. Peter calculates the sum of the numbers on every pair of cards. He obtains only three different totals, 57, 70, and 83. What is the largest integer on any card?

(**A**) 35   (**B**) 42   (**C**) 48   (**D**) 53   (**E**) 82

23. A square with area 30 is divided in two by a diagonal and then into triangles, as shown. The areas of some of these triangles are given in the diagram.
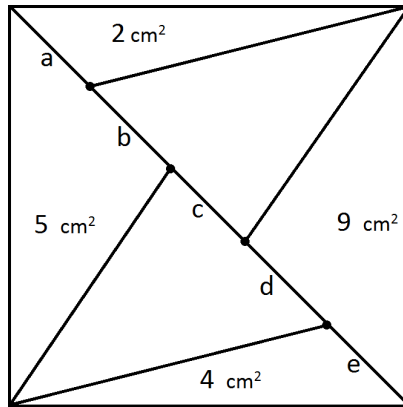
Which part of the diagonal is the longest?

(**A**) a   (**B**) b   (**C**) c   (**D**) d   (**E**) e

24. In a group of kangaroos, the two lightest kangaroos weigh 25% of the total weight of the group. The three heaviest kangaroos weigh 60% of the total weight. How many kangaroos are in the group?

(**A**) 6   (**B**) 7   (**C**) 8   (**D**) 15   (**E**) 20

25. Cyril has seven pieces of wire with lengths 1 cm, 2 cm, 3 cm, 4 cm, 5 cm, 6 cm and 7 cm. He uses some pieces to make a wire cube with edges of length 1 cm without any overlaps.
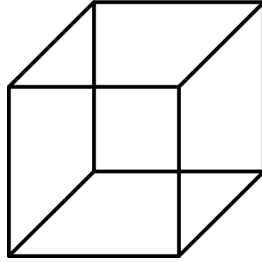
What is the smallest number of these pieces that he can use?

(**A**) 1   (**B**) 2   (**C**) 3   (**D**) 4   (**E**) 5

26. In trapezium $PQRS$, the sides PQ and SR are parallel. Angle RSP is $120°$ and $RS = SP = \frac{1}{3} PQ$. What is the size of angle PQR ?

(**A**) $15°$ (**B**) $22.5°$ (**C**) $25°$ (**D**) $30°$ (**E**) $45°$

27. Five points lie on a line. Alex finds the distances between every possible pair of points. He obtains, in increasing order, 2, 5, 6, 8, 9, k, 15, 17, 20 and 22. What is the value of k?

(**A**) 10   (**B**) 11   (**C**) 12   (**D**) 13   (**E**) 14

28. Yesterday I wrote down my friend Ekin's telephone number. The telephone number on my note has six digits, but I remember that Ekin said that the number had seven digits. I have no idea what digit I forgot to write down, or its position in the number. How many different telephone numbers do I have to try to be sure that I use the correct one? (Note that a telephone number may start with any digit, including 0).

(**A**) 55   (**B**) 60   (**C**) 64   (**D**) 70   (**E**) 80

29. Mary divides 2015 successively by 1, 2, 3 and so on, up to and including 1000. She writes down the remainder for each division. What is the largest of these remainders?

(**A**) 15   (**B**) 215   (**C**) 671   (**D**) 1007
(**E**) Some other value

30. Every positive integer is to be coloured according to the following three rules.
(i) Each number is either red or green.
(ii) The sum of any two different red numbers is a red number.
(iii) The sum of any two different green numbers is a green number.
In how many different ways can this be done?

(**A**) 0   (**B**) 2   (**C**) 4   (**D**) 6
(**E**) more than 6