

1. How many letters of the word **MATHEMATICS** do not have any lines of symmetry?

- A 0                      B 1                      C 2                      D 3                      E 4

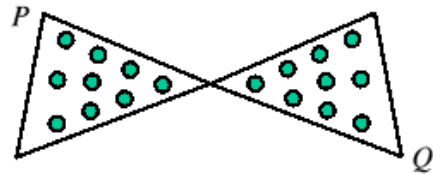
2. Nadiya is baking a cake. The recipe says that her cake should be baked in the oven for 1 hour and 35 minutes. She puts the cake in the oven at 11:40 am. At what time should she take the cake out of the oven?

- A 12:15 pm      B 12:40 pm      C 1:05 pm      D 1:15 pm      E 2:15 pm

3. What is the value of  $\frac{12\ 345}{1 + 2 + 3 + 4 + 5}$  ?

- A 1                      B 8                      C 678                      D 823                      E 12 359

4. A ladybird has landed at point *P* on Sam's bow-tie. If it travels only along the edges of the bow-tie, but cannot travel along any edge more than once, how many different ways are there for it to get from *P* to *Q*?



- A 1      B 2      C 3      D 4      E 5

5. What is the value of  $201 \times 7 - 7 \times 102$  ?

- A 142 800      B 793                      C 693                      D 607                      E 0

6. Which of these fractions is nearest to 1?

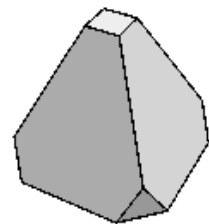
- A  $\frac{12}{23}$                       B  $\frac{23}{34}$                       C  $\frac{34}{45}$                       D  $\frac{45}{56}$                       E  $\frac{56}{67}$

7. The lightest seeds in the world are probably those of the Creeping Lady's-tresses Orchid, 500 000 of which would weigh 1 gram. How many millions of these seeds weigh 1 kilogram?

- A 2                      B 200                      C 500                      D 5 000                      E 1 000 000

8. A solid square-based pyramid has all of its corners cut off, as shown. How many edges does the resulting shape have?

- A 8      B 13      C 15      D 20      E 24



9. In William Shakespeare's play *As You Like It*, Rosalind speaks to Orlando about "He that will divide a minute into a thousand parts".

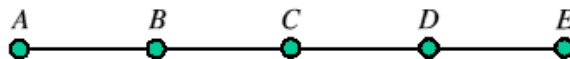
Which of the following is equal to the number of seconds in one thousandth of one minute?

- A 0.24            B 0.6            C 0.024            D 0.06            E 0.006

10. In the expression  $1 \square 2 \square 3 \square 4$  each  $\square$  is to be replaced by either  $+$  or  $\times$ . What is the largest value of all the expressions that can be obtained in this way?

- A 10            B 14            C 15            D 24            E 25

11. The diagram shows a rod with five equally spaced points  $A, B, C, D$  and  $E$  marked on it.



The rod is rotated three times through 180 degrees, first about  $A$ , then about  $B$  and finally about  $E$ . Which point finishes in the same position as it was at the start?

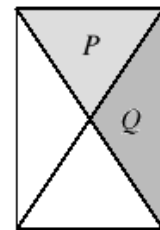
- A  $A$             B  $B$             C  $C$             D  $D$             E  $E$

12. The White Rabbit has an appointment to see the Red Queen at 4pm every day apart from weekends. On Monday, he arrives 16 minutes late. Each day after that he hurries more and more and so manages to halve the amount of time that he arrives late each day. On what day of the week does he arrive just 15 seconds late?

- A Monday            B Tuesday            C Wednesday            D Thursday            E Friday

13. A rectangle is split into triangles by drawing in its diagonals. What is the ratio of the area of triangle  $P$  to the area of triangle  $Q$ ?

- A 1 : 1            B 1 : 2            C 2 : 1            D 2 : 3  
E the ratio depends on the lengths of the sides of the rectangle



14. The Kings of Clubs, Diamonds, Hearts and Spades, and their respective Queens, are having an arm wrestling competition. Everyone must wrestle everyone else, except that no King will wrestle his own Queen. How many wrestling bouts are there?

- A 12            B 16            C 24            D 28            E 64

15. Which of the following is divisible by all of the integers from 1 to 10 inclusive?

- A  $23 \times 34$             B  $34 \times 45$             C  $45 \times 56$             D  $56 \times 67$             E  $67 \times 78$