

Q1

A robot, which is initially facing North, is programmed to travel 5m then turn through 10° , travel 5m then turn through 20° , travel 5m then turn through 30° , and so on. Each move consists of moving 5m in a straight line and then turning clockwise through an angle which increases by 10° at each move.

How far has it travelled by the time it is first facing due East at the end of a move?

Q2

Exactly one of these statements is correct. Which one?

A $44^2 + 77^2 = 4477$

B $55^2 + 66^2 = 5566$

C $66^2 + 55^2 = 6655$

D $88^2 + 33^2 = 8833$

E $99^2 + 22^2 = 9922$

Q3

Jack and Jill played a game for two people. In each game, the winner was awarded 2 points and the loser 1 point. No games were drawn. Jack won exactly 4 games and Jill had a final score of 10 points. How many games did they play?

Q4

Four of these jigsaw pieces fit together to form a rectangle. Which one is not used?



Q5

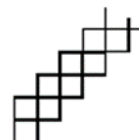
A die has the shape of a regular tetrahedron, with the four faces having 1, 2, 3 and 4 pips. The die is placed with 4 pips 'face down' in one corner of the triangular grid shown, so that the face with 4 pips precisely covers the triangle marked with 4 pips. The



die is now 'rolled', by rotating about an edge without slipping, so that 1 pip is face down. It is rolled again, so that 2 pips are face down, as indicated. The rolling continues until the die rests on the shaded triangle in the opposite corner of the grid. How many pips are now face down?

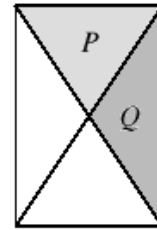
Q6

A shape consisting of 2004 small squares is made by continuing the pattern shown in the diagram. The small squares have sides of length 1cm. What is the length, in cm, of the perimeter of the whole shape?

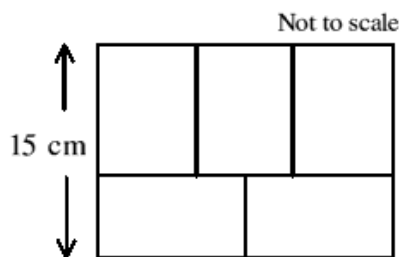


Q7

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 ?



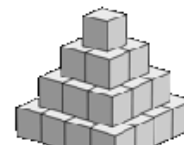
Q8



Five identical rectangles fit together as shown.
What, in cm^2 , is the total area which they cover?

Q9

The diagram shows a pyramid made up of 30 cubes, each measuring $1\text{ m} \times 1\text{ m} \times 1\text{ m}$.
What is the total surface area of the whole pyramid (including its base)?



Q10

The digits in the product $13 \times 2 = 26$ can be rearranged to give $16 \times 2 = 32$ as well as $31 \times 2 = 62$. In which one of the following can the digits not be rearranged to give another correct product?

- A $12 \times 3 = 36$ B $12 \times 7 = 84$ C $26 \times 3 = 78$ D $16 \times 3 = 48$ E $39 \times 2 = 78$

Q11

In this addition each letter stands for a different digit, with S standing for 3. What is the value of $Y \times O$?

$$\begin{array}{r} \\ + \\ \hline \\ \end{array}$$

Q12

In a certain code, $A = 1$, $B = 2$, $C = 3$ etc. Words are encoded by multiplying together the values of their letters, so the code for SQUARE is $19 \times 17 \times 21 \times 1 \times 18 \times 5 = 610\,470$. Similarly, the code for RECTANGLE is 31 752 000. What is the code for TRIANGLE?

Q13

Jack dances clockwise around the Maypole, making one revolution every five seconds. Starting from a point diametrically opposite Jack's starting point, Jill dances anticlockwise, making one revolution every six seconds. How many times do they pass each other in the first minute?

