SASMO 2015 SECONDARY 1 [15 MCQ + 10 NON-MCQ = 25 Q]

Starting Score = 15 marks (to avoid negative marks); Max Possible Score = 85 marks

Section A (Correct answer = 2 marks; no answer = 0; incorrect answer = minus 1 mark)

1. Given that $-3 \leq x \leq 4$, find the least possible value of x^2.

   (a) 16
   (b) 9
   (c) 1
   (d) 0
   (e) None of the above

2. Find the largest odd number between 1 and 100 that is divisible by 6 and by 7.

   (a) 42
   (b) 54
   (c) 56
   (d) 84
   (e) None of the above

3. Find the next term of the following sequence: 3, 1, 4, 5, 21, …

   (a) 45
   (b) 46
   (c) 47
   (d) 106
   (e) 2015

4. If both n and $\frac{18}{n}$ are positive integers, how many possible values of n are there?

   (a) 4
   (b) 5
   (c) 6
   (d) 7
   (e) None of the above

5. A palindromic number is a whole number that reads the same forward and backward. For example, 1221 is a palindromic number. How many 5-digit palindromic numbers are there?

   (a) 190
   (b) 900
   (c) 1000
   (d) 90000
   (e) None of the above

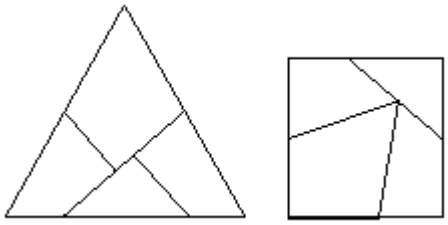
6. An operator ♦ acts on two numbers to give the following outcomes:

$3 \diamond 2 = 15$
$5 \diamond 3 = 28$
$1 \diamond 6 = -57$
$4 \diamond 9 = -513$

What is $5 \diamond 7$ equal to?

(a) 122
(b) 212
(c) –122
(d) –212
(e) None of the above

7. The diagram shows how an equilateral triangle can be cut into four pieces and rearranged to form a square. This solution of the Haberdasher's Puzzle is discovered by Henry Dudeney (1857 – 1930).



If the length of the square is 19 cm and the height of the triangle is 25 cm, find the length of the triangle, correct to the nearest whole number.

(a) 27 cm
(b) 28 cm
(c) 29 cm
(d) 30 cm
(e) 31 cm

8. Some people are standing equally spaced around a circle, and they were numbered starting from the number 1 in a clockwise direction. If the person numbered 14 is directly opposite the person numbered 40, how many people are there?

(a) 48
(b) 50
(c) 52
(d) 54
(e) 56

9. If the five-digit number 4567N is divisible by 8, find N.

(a) 8
(b) 6
(c) 4
(d) 2
(e) 0

10. A big cube is made up of 27 small cubes. All the faces of the big cube are then painted. How many of the small cubes have exactly two painted faces?

(a) 4
(b) 8
(c) 12
(d) 16
(e) None of the above

11. The figure shows a circle with 4 points on its circumference. Each point is joined to every other point by a line (called a chord). The chords divide the circle into 8 regions.

Find the *maximum* number of regions formed by the chords for a circle with 5 points.

(a) 14
(b) 15
(c) 16
(d) 17
(e) None of the above

12. The product of two numbers is 10 000. Neither of the two numbers has 10 as a factor. Find the difference of these two numbers.

(a) 45
(b) 210
(c) 609
(d) 1242
(e) Not enough given information to find

13. Find the smallest whole number n for which $108n$ is a multiple of 360.

(a) 3
(b) 5
(c) 10
(d) 30
(e) None of the above

14. A circle and a quadrilateral are drawn on a flat surface.What is the biggest number of regions that can be formedon the surface?

(a) 6
(b) 8
(c) 10
(d) 12
(e) 14

15. 70 cakes are packed in two different box sizes. The small box holds 6 cakes and the big box holds 8 cakes. If more than 10 boxes are used and all the boxes are fully packed, how many small boxes are used?

(a) 2
(b) 5
(c) 7
(d) 9
(e) 11

Section B (Correct answer = 4 marks; incorrect or no answer = 0)

16. Jane is at a road junction with four possible roads to her friend's house, but she did not know which road to take. So she asks some passerby for direction.

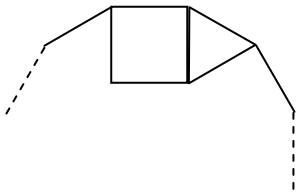
First Passerby:	Your friend's house is not on Road 1.
Second Passerby:	I did not want to live near your friend, so I moved from Road 2 to Road 4.
Third Passerby:	I have taken Road 2 to the beach before, but I have not passed by any house.
Fourth Passerby:	Your friend stays on Road 3.

If only one of the passerby is telling the truth, on which road does Jane's friend live?

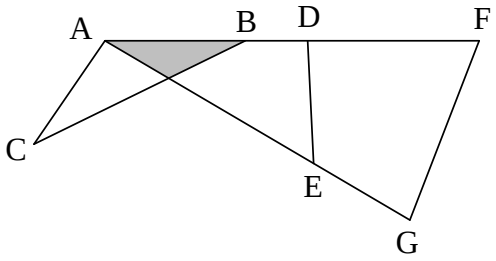
17. Elsie has 20 pens. She divides them into 4 piles so that each pile has a different number of pens. Find the smallest possible number of pens in the biggest pile.

18. Anna thinks of 7 different positive integers. None of the integers is a multiple of each other. What is the least possible sum of these 7 integers?

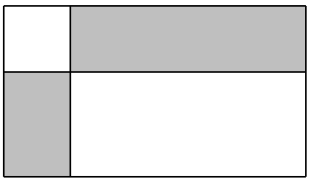
19. The diagram shows a square, an equilateral triangle and parts of a regular polygon. How many sides does the latter polygon have?



20. In the figure below, the ratio of the area of ΔABC to the area of ΔADE to the area of ΔAFG is 7 : 8 : 15. Given that $\frac{1}{4}$ of the area of ΔADE is shaded, what fraction of the figure is shaded?



21. The diagram shows a rectangle being divided into 3 smaller rectangles and a square. If the perimeter of the unshaded rectangle is 42 cm and the area of the square is 49 cm^2, find the total area of the shaded rectangles.

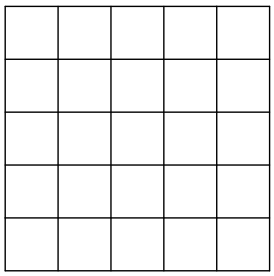


22. Polite numbers are numbers that can be expressed as the sum of two or more consecutive positive integers, e.g.

$$5 = 2 + 3;$$
$$9 = 2 + 3 + 4 = 4 + 5.$$

Find all the polite numbers that can be expressed as the sum of *two* consecutive positive integers.

23. How many rectangles are there in a 5×5 square grid?



24. Find the last digit of $1^{2015} + 2^{2015} + 3^{2015} + \ldots + 10^{2015}$.

25. In the following cryptarithm, all the different letters stand for different digits. Find the 5-digit number EFCBH.

$$\begin{array}{cccccc} & & A & B & C & D \\ + & & E & F & G & B \\ \hline & E & F & C & B & H \\ \hline \end{array}$$