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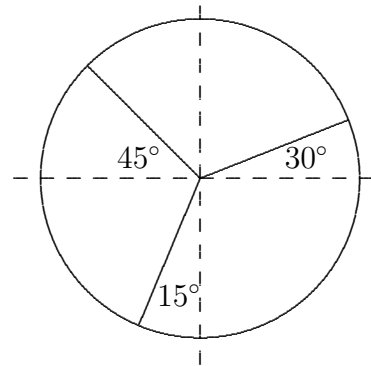
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6. Consider all the integers from 1 to 100 inclusive. What is the difference between the sum of all the even numbers and the sum of all the odd numbers?

(A) 0 (B) 25 (C) 50 (D) 100 (E) 200

7. Paul's three children have birthdays in the same week. He bought a circular birthday cake and divided the cake in proportion to their ages as shown. If none of his children is older than 17, what is the sum of their three ages?

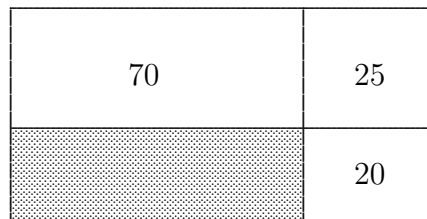
(A) 24 (B) 28 (C) 32
(D) 36 (E) 40



8. What is the remainder when 2^{2010} is divided by 7?

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

9. The areas, in square centimetres, of three rectangles are given.



What is the area, in square centimetres, of the shaded rectangle?

(A) 36 (B) 48 (C) 56 (D) 60 (E) 70

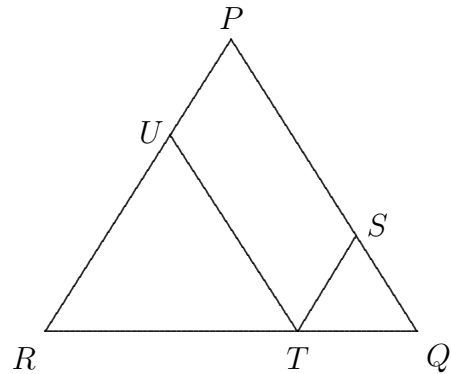
10. If $\frac{1}{6} = \frac{1}{2} + \frac{1}{x}$, the value of x is

(A) -3 (B) $\frac{1}{3}$ (C) 3 (D) 4 (E) -4

Questions 11 to 20, 4 marks each

11. The perimeter of the equilateral triangle PQR is 48 cm.
What is the perimeter, in centimetres, of the parallelogram $PSTU$?

(A) 16 (B) 20 (C) 24
(D) 32 (E) 36



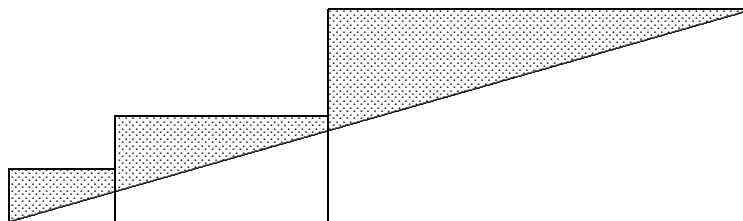
12. I am going to the shop with \$4.20 to spend on my favourite chocolates, hazelnut truffles at 30c each and orange truffles at 50c each. I do not want to buy more than twice as many of one as the other. Apart from that, I want to buy as many truffles as I can. How many is that?

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

13. Which of the following numbers cannot be expressed as the sum of two or more consecutive positive integers?

(A) 12 (B) 13 (C) 14 (D) 15 (E) 16

14. Three rectangles are lined up horizontally as shown. The lengths of the rectangles are 2 cm, 4 cm and 8 cm respectively. The heights are 1 cm, 2 cm and 4 cm respectively. A straight line is drawn from the top right-hand corner of the largest rectangle to the bottom left-hand corner of the smallest rectangle.



What is the area, in square centimetres, of the shaded region?

(A) 10 (B) 12 (C) 14 (D) 18 (E) 21

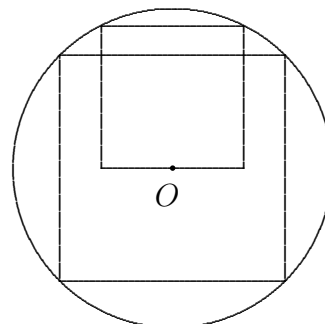
15. The value of $(123456785) \times (123456782) - (123456783) \times (123456784)$ is

(A) -2 (B) -1 (C) 0 (D) 1 (E) none of these

16. A three-digit number has all digits odd. How many such numbers are divisible by three?

(A) 29 (B) 36 (C) 39 (D) 40 (E) 41

17. Two squares are drawn inside a circle with centre O . The larger square touches the circle at each of its corners. The smaller square touches the circle at two of its corners and one of its sides passes through the centre of the circle as shown.



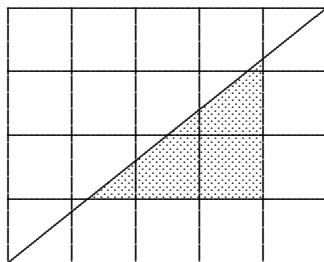
What is the ratio of the area of the larger square to that of the smaller square?

(A) 3 : 1 (B) 5 : 2 (C) $\sqrt{5} : 2$
 (D) 2 : 1 (E) $3 : \sqrt{6}$

18. How many integers n from 2 to 10 inclusive have the property that the sum of any consecutive n positive numbers is odd?

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

19. The side length of the grid squares in the figure is 1 cm.



What is the area, in square centimetres, of the shaded triangle?

(A) $\frac{120}{40}$ (B) $\frac{111}{40}$ (C) $\frac{116}{40}$ (D) $\frac{125}{40}$ (E) $\frac{121}{40}$

20. The 5-digit number $a986b$, where a is the first digit and b is the units digit, is divisible by 72. What is the value of $a + b$?

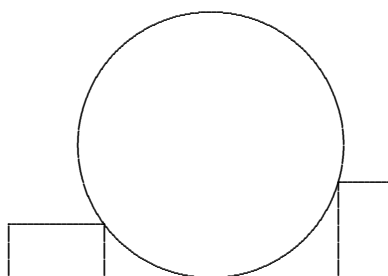
(A) 9 (B) 10 (C) 12 (D) 13 (E) 15

For questions 26 to 30, shade the answer as an integer from 0 to 999 in the space provided on the answer sheet.

Question 26 is 6 marks, question 27 is 7 marks, question 28 is 8 marks, question 29 is 9 marks and question 30 is 10 marks.

26. How many whole numbers less than 2010 have exactly three factors?

27. Two $10 \times 18 \times \ell$ blocks are placed on either side of a cylinder of length ℓ to stop it from rolling. One block has a $10 \times \ell$ face on the ground while the other block has an $18 \times \ell$ face on the ground. The block on the left sticks out 4 units more than the one on the right.



What is the radius of the cylinder?

28. A 3-digit number is subtracted from a 4-digit number and the *result* is a 3-digit number.

$$\square\square\square\square - \square\square\square = \square\square\square$$

The 10 digits are all different.

What is the smallest possible result?

29. I have a list of thirty numbers where the first number is 1, the last number is 30 and each of the other numbers is one more than the average of its two neighbours. What is the largest number in the list?

30. There are many towns on the island of Tetra, all connected by roads. Each town has three roads leading to three other different towns: one red road, one yellow road and one blue road, where no two roads meet other than at towns. If you start from any town and travel along red and yellow roads alternately (RYRY...) you will get back to your starting town after having travelled over six different roads. In fact RYRYRY will always get you back to where you started. In the same way, going along yellow and blue roads alternately will always get you back to the starting point after travelling along six different roads (YBYBYB). On the other hand, going along red and blue roads alternately will always get you back to the starting point after travelling along four different roads (RBRB). How many towns are there on Tetra?