

SECTION ONE - (3 points problems)

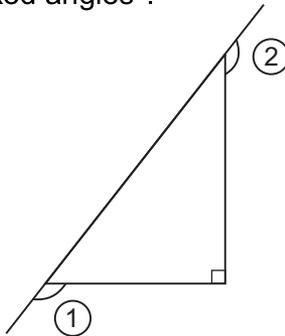
1. How many whole numbers are there between 20.16 and 3.17?

- (A) 15                      (B) 16                      (C) 17                      (D) 18                      (E) 19

2. Which of the following traffic signs has the largest number of axes of symmetry?

- (A)       (B)       (C)       (D)       (E) 

3. What is the sum of the two marked angles ?

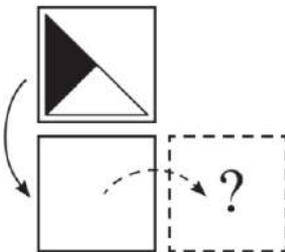


- (A)  $150^\circ$                       (B)  $180^\circ$                       (C)  $270^\circ$                       (D)  $320^\circ$                       (E)  $360^\circ$

4. Jenny had to add 26 to a certain number. Instead she subtracted 26 and obtained -14. What number should she have obtained?

- (A) 28                      (B) 32                      (C) 36                      (D) 38                      (E) 42

5. Joanna turns a card over about its lower edge and then about its right-hand edge, as shown. What does she see?



- (A)       (B)       (C)   
 (D)       (E) 

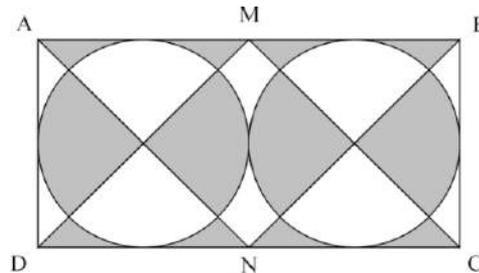
6. Kanga combines 555 groups of 9 stones into a single pile. She then splits the resulting pile into groups of 5 stones. How many groups does she get?

- (A) 999                      (B) 900                      (C) 555                      (D) 111                      (E) 45

7. In the school newspaper I read that 60% of our teachers get to school by bike. These are 45 teachers. Only 12% of our teachers use their car to get to school. These are

- (A) 4 teachers.                      (B) 6 teachers.                      (C) 9 teachers.  
(D) 10 teachers.                      (E) 12 teachers.

8. ABCD is a rectangle and M, N are the midpoints of sides AB and CD, respectively. The circles are tangent to the sides of rectangle and to each other. If AB = 10 cm, what is the area of the gray region?

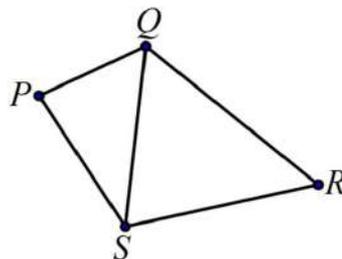


- (A)  $\frac{25\pi}{4} \text{ cm}^2$                       (B)  $20 \text{ cm}^2$                       (C)  $50 - \frac{25\pi}{4} \text{ cm}^2$   
(D)  $25 \text{ cm}^2$                       (E)  $5 \text{ cm}^2$

9. Two pieces of rope have length 1 m and 2 m. Alex cuts the pieces into several parts. All the parts have equal length. Which of the following could not be the total number of parts he obtains?

- (A) 6                      (B) 8                      (C) 9                      (D) 12                      (E) 15

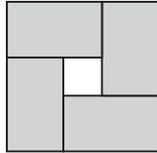
10. Four towns P, Q, R and S are connected by roads, as shown. A race uses each road exactly once. The race starts at S and finishes at Q. How many possible routes are there for the race?



- (A) 10                      (B) 8                      (C) 6                      (D) 4                      (E) 2

## SECTION TWO - (4 points problems)

11. The diagram shows four identical rectangles placed inside a square.



The perimeter of each rectangle is 16 cm. What is the perimeter of the square?

- (A) 16 cm      (B) 20 cm      (C) 24 cm      (D) 28 cm      (E) 32 cm

12. Petra has 49 blue beads and one red bead. How many beads must Petra remove so that 90% of her beads are blue?

- (A) 4      (B) 10      (C) 29      (D) 39      (E) 40

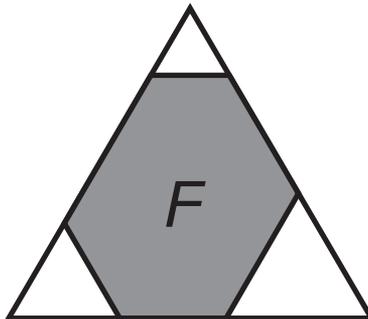
13. Which of the following fractions has a value closest to  $\frac{1}{2}$ ?

- (A)  $\frac{25}{79}$       (B)  $\frac{27}{59}$       (C)  $\frac{29}{57}$       (D)  $\frac{52}{79}$       (E)  $\frac{57}{92}$

14. Ivor writes down the results of the quarter - finals, the semi - finals and the final of a knock-out tournament. The results are (not necessarily in this order): Bart beat Antony, Carl beat Damien, Glen beat Henry, Glen beat Carl, Carl beat Bart, Ed beat Fred and Glen beat Ed. Which pair played in the final?

- (A) Glen and Henry      (B) Glen and Carl      (C) Carl and Bart  
(D) Glen and Ed      (E) Carl and Damien

15. Three equilateral triangles are cut off in the bigger equilateral triangle of perimeter 60 cm. If the perimeter of the obtained figure F is 40 cm then the sum of the perimeters of the triangles that we cut off, equals

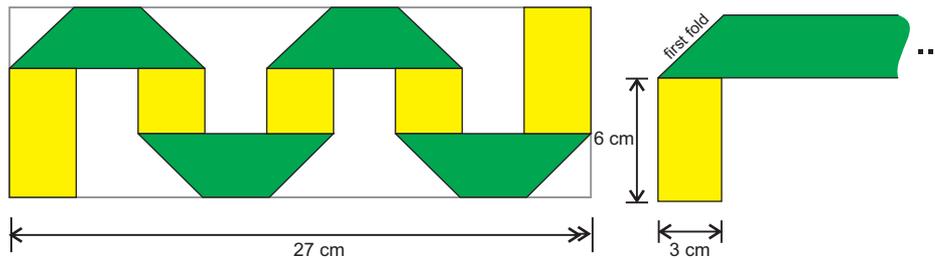


- (A) 80 cm      (B) 75 cm      (C) 66 cm  
(D) 54 cm      (E) 60 cm

16. Tim, Tom and Jim are triplets (three brothers born on the same day). Their twin brothers John and James are 3 years younger. Which of the following numbers could be the sum of the ages of the five brothers?

- (A) 36                      (B) 53                      (C) 76                      (D) 89                      (E) 92

17. A 3 cm wide rectangular strip of paper is green on one side and yellow on the other. Maria folds the strip, as shown. The green trapeziums are identical. What is the length of the original strip? (figure just shows folded strip length 27 and part height 6)

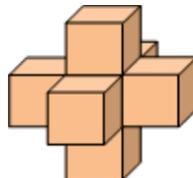


- (A) 36 cm                      (B) 48 cm                      (C) 54 cm                      (D) 57 cm                      (E) 81 cm

18. Two kangaroos Jum and Per start to jump at the same time, from the same point, in the same direction. After that, they make one jump per second. Each of Jum's jumps is 6 m in length. Per's first jump is 1 m in length, the second is 2 m, the third is 3 m, and so on. After how many jumps does Per catch Jum?

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

19. Seven standard dice are glued together to make the solid shown. The faces of the dice that are glued together have the same number of dots on them. How many dots are on the surface of the solid?



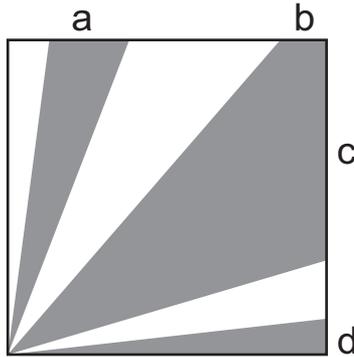
- (A) 24                      (B) 90                      (C) 95                      (D) 105                      (E) 126

20. There are 20 students in a class. They sit in pairs so that exactly one third of the boys sits with a girl, and exactly one half of the girls sits with a boy. How many boys are there in the class?

- (A) 9                      (B) 12                      (C) 15                      (D) 16                      (E) 18

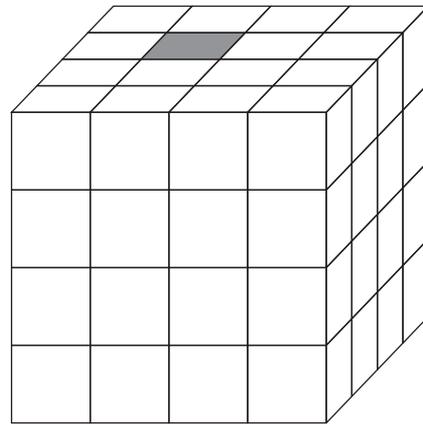
SECTION THREE - (5 points problems)

21. Inside a square of area 36, there are shaded regions as shown. The total shaded area is 27. What is  $a + b + c + d$ ?



- (A) 4                      (B) 6                      (C) 8                      (D) 9                      (E) 10
22. Theo's watch is 10 minutes slow, but he believes that it is 5 minutes fast. Leo's watch is 5 minutes fast, but he believes that it is 10 minutes slow. At the same moment, each of them looks at his own watch. Theo thinks it is 12:00. What time does Leo think it is?
- (A) 11:30                      (B) 11:45                      (C) 12:00                      (D) 12:30                      (E) 12:45
23. Twelve girls met in a café. On average, they ate 1.5 cup-cakes. None of them ate more than two cup-cakes and two of them had only mineral water. How many girls ate two cup-cakes?
- (A) 2                      (B) 5                      (C) 6                      (D) 7                      (E) 8
24. Little Red Riding Hood is delivering waffles to three grannies. She starts with a basket full of waffles. Just before she enters each of the grannies' houses, the Big Bad Wolf eats half of the waffles in her basket. When she leaves the third granny's house, she has no waffles left. She delivers the same number of waffles to each granny. Which of the following numbers definitely divides the number of waffles she started with?
- (A) 4                      (B) 5                      (C) 6                      (D) 7                      (E) 9

25. The cube in the picture is divided into 64 small cubes. Exactly one of the cubes is grey. On the first day, the grey cube changes all its neighbouring cubes to grey (two cubes are neighbours if they have a common face). On the second day, all the grey cubes do the same thing. How many grey cubes are there at the end of the second day?

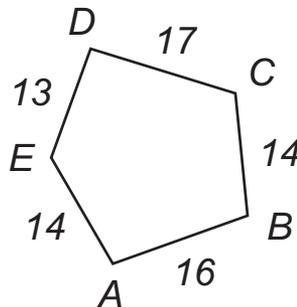


- (A) 11                      (B) 13                      (C) 15  
(D) 16                      (E) 17

26. Several different positive integers are written on a blackboard. The product of the smallest two of them is 16. The product of the largest two is 225. What is the sum of all the integers?

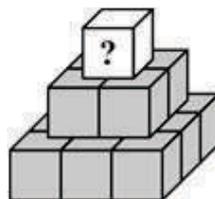
- (A) 38                      (B) 42                      (C) 44                      (D) 58                      (E) 243

27. The diagram shows a pentagon. Sepideh draws five circles with centres  $A, B, C, D, E$  such that the two circles on each side of the pentagon touch. The lengths of the sides of the pentagon are given. Which point is the centre of the largest circle that she draws?



- (A) A                      (B) B                      (C) C                      (D) D                      (E) E

28. Katie writes a different positive integer on each of the fourteen cubes in the pyramid. The sum of the nine integers written on the bottom cubes is equal to 50. The integer written on each other cube is equal to the sum of the integers written on the four cubes underneath it. What is the greatest possible integer that can be written on the top cube?

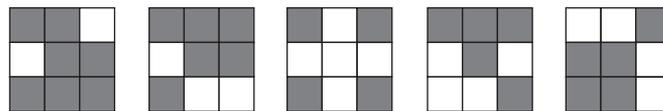


- (A) 80                      (B) 98                      (C) 104                      (D) 110                      (E) 118

29. A train has five carriages, each containing at least one passenger. Two passengers are said to be "neighbours" if either they are in the same carriage or they are in two adjacent carriages. Each passenger has either exactly five or exactly ten "neighbours". How many passengers are there in the train?

- (A) 13                      (B) 15                      (C) 17                      (D) 20  
 (E) There is more than one possibility.

30. A  $3 \times 3 \times 3$  cube is built from 15 black cubes and 12 white cubes. Five faces of the larger cube are shown.



Which of the following is the sixth face of the large cube?

