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Intermediate Division

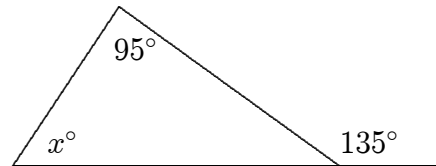
Questions 1 to 10, 3 marks each

1. $92.2 - 85.3$ equals

- (A) 6.1 (B) 6.9 (C) 7.1 (D) 7.5 (E) 7.9
-

2. In the diagram, the value of x is

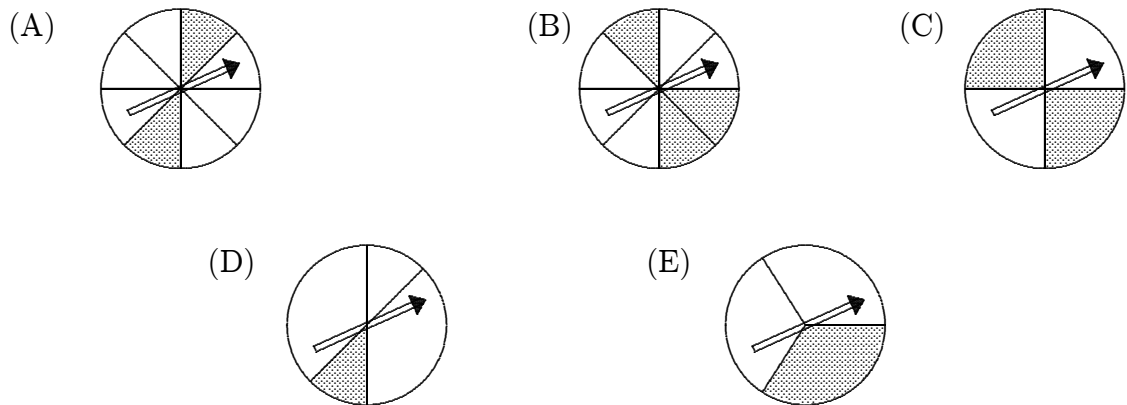
- (A) 35 (B) 40 (C) 45 (D) 50 (E) 55



3. If $a = 2b - 5$, then b equals

- (A) $\frac{a}{2}$ (B) $\frac{a}{2} + 5$ (C) $\frac{a - 5}{2}$ (D) $\frac{a + 5}{2}$ (E) $2a + 5$
-

4. Which of the spinners below would give a one-in-four chance of the arrow landing in the shaded region?



5. The area, in square centimetres, of one face of a cube whose volume is 64 cm^3 is

- (A) 8 (B) 16 (C) 24 (D) 32 (E) 64
-

6. The average of five numbers is 4. Four of them are 1, 2, 3 and 4. What is the other?

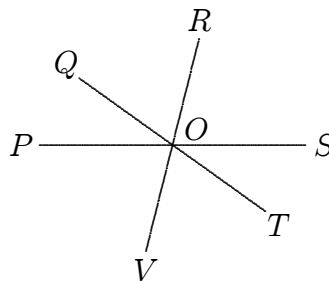
- (A) 6 (B) 7 (C) 8 (D) 9 (E) 10

7. $\frac{1}{4}\%$ expressed as a decimal is

- (A) 0.235 (B) 0.14 (C) 0.025 (D) 0.014 (E) 0.0025

8. In the diagram, $\angle POR = 120^\circ$ and $\angle QOS = 145^\circ$.
The size of $\angle TOV$ is

- (A) 45° (B) 60° (C) 85°
(D) 90° (E) 95°



9. The page numbers of a book are consecutive whole numbers. If you begin reading at the top of page x and stop reading at the bottom of page y , the number of pages you have read is

- (A) $x - y$ (B) $y - x$ (C) $x + y$ (D) $y - x + 1$ (E) $y - x - 1$

10. Jim notices the odometer of his car reads 062319 km where all the digits are different. The shortest distance, in kilometres, he will travel before the digits are all different again is

- (A) less than 10 (B) between 10 and 20 (C) between 20 and 30
(D) between 30 and 40 (E) greater than 40

Questions 11 to 20, 4 marks each

11. The middle date of the year in 2006 is

- (A) 29th June (B) 30th June (C) 1st July (D) 2nd July (E) 3rd July

12. Each of the vertices of a square $PQRS$ is given a number. For each of the sides of the square the sum of the numbers at its endpoints is calculated. If for PQ this sum is 3, for QR it is 7 and for RS it is 12, what is the sum for PS ?

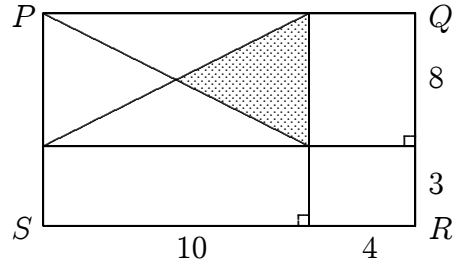
- (A) 2 (B) 7 (C) 8 (D) 16 (E) 22

13. In the sequence of numbers $\dots, q, r, s, t, 0, 1, 1, 2, 3, 5, 8, \dots$, each number is the sum of its two preceding numbers. What is the value of q ?

- (A) -3 (B) -1 (C) 0 (D) 1 (E) 3

14. What fraction of the rectangle $PQRS$ in the diagram is shaded?

- (A) $\frac{1}{16}$ (B) $\frac{3}{5}$ (C) $\frac{1}{8}$
 (D) $\frac{1}{10}$ (E) $\frac{10}{77}$



15. A train travelling at constant speed takes a quarter of a minute to pass a signpost and takes three-quarters of a minute to pass completely through a tunnel which is 600 m in length. The speed of the train, in kilometres per hour, is

- (A) 50 (B) 56 (C) 64 (D) 72 (E) 80

16. In the multiplication

$$\begin{array}{r} P \ 7 \ * \ * \\ \quad \quad \quad \quad \quad 6 \ \times \\ \hline * \ 2 \ * \ 8 \ 4 \end{array}$$

P and $*$ stand for digits. P could be

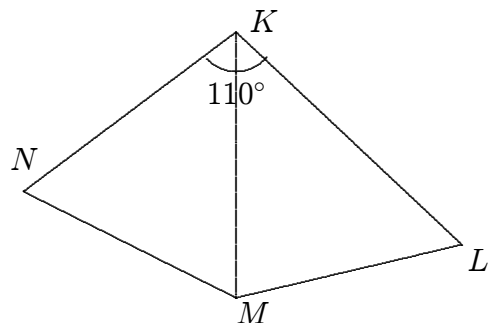
- (A) 7 (B) 6 (C) 5 (D) 9 (E) 8

17. How many different pairs of 2-digit numbers multiply to give a 3-digit number with all digits the same?

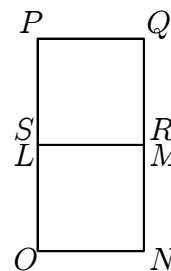
- (A) 5 (B) 6 (C) 7 (D) 8 (E) 9

18. In the quadrilateral $KLMN$, $KM = KL = KN$.
 If $\angle NKL = 110^\circ$, then the size of $\angle LMN$ is

- (A) 70° (B) 115° (C) 125°
 (D) 140° (E) 145°



24. The squares $PQRS$ and $LMNO$ have equal sides of 1 m and are initially placed so that the side SR touches LM as shown. The square $PQRS$ is rotated about R until Q coincides with N . The square is then rotated about Q until P coincides with O .



It is then rotated about P until S coincides with L and then finally rotated about S until R coincides with M and the square is now back to its original position.

The length, in metres, of the path traced out by the point P in these rotations is

- (A) $\pi(2 + \sqrt{2})$ (B) 4π (C) $2\pi(2 + \sqrt{2})$ (D) 2π (E) $\pi(3 + \sqrt{2})$
-

25. The vertices of a cube are each labelled with one of the integers 1, 2, 3, ..., 8. A *face-sum* is the sum of the labels of the four vertices on a face of the cube. What is the maximum number of equal face-sums in any of these labellings?

- (A) 2 (B) 3 (C) 4 (D) 5 (E) 6
-

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

26. If $(1 + 3 + 5 + \dots + p) + (1 + 3 + 5 + \dots + q) = (1 + 3 + 5 + \dots + 25)$, what is the value of $p + q$?
-

27. Each of the students in a class writes a different 2-digit number on the whiteboard. The teacher claims that no matter what the students write, there will be at least three numbers on the whiteboard whose digits have the same sum. What is the smallest number of students in the class for the teacher to be correct?
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28. In a quadrilateral $PQRS$, X is a point on QR and Y is point on PS . One circle touches all four sides of the quadrilateral $PQXY$, and another circle touches all four sides of $XRSY$. If $PQ = 10$ cm, $QR = 20$ cm, $RS = 14$ cm and $PS = 26$ cm, what is the length, in centimetres, of XY ?
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29. In a regular polygon there are two diagonals such that the angle between them is 50° . What is the smallest number of sides of the polygon for which this is possible?
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30. The sum of n positive integers is 19. What is the maximum possible product of these n numbers?
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