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Intermediate Division

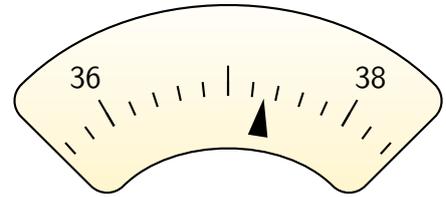
Questions 1 to 10, 3 marks each

1. The value of $\frac{2018 - 18}{1000}$ is

- (A) 0.02 (B) 0.1 (C) 1 (D) 2 (E) 2000
-

2. What value is indicated on this charisma-meter?

- (A) 36.65 (B) 37.65 (C) 38.65
(D) 37.15 (E) 37.3

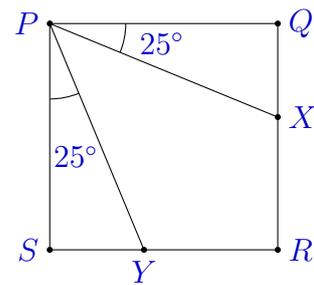


3. What is the difference between the sum and the product of 4 and 5?

- (A) 1 (B) 8 (C) 9 (D) 11 (E) 20
-

4. In the diagram, $PQRS$ is a square. What is the size of $\angle XPY$?

- (A) 25° (B) 30° (C) 35°
(D) 40° (E) 45°



5. Which of the following is not a whole number?

- (A) $350 \div 2$ (B) $350 \div 7$ (C) $350 \div 5$ (D) $350 \div 25$ (E) $350 \div 20$
-

6. Nora, Anne, Warren and Andrew bought plastic capital letters to spell each of their names on their birthday cakes. Their birthdays are on different dates, so they planned to reuse letters on different cakes.



What is the smallest number of letters they needed?

- (A) 8 (B) 9 (C) 10 (D) 11 (E) 12

7. In years, 2018 days is closest to

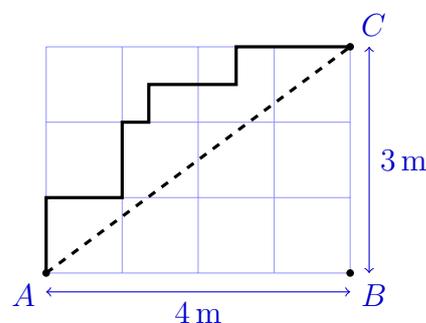
- (A) 4.5 years (B) 5 years (C) 5.5 years (D) 6 years (E) 6.5 years

8. Two paths from A to C are pictured.

The stepped path consists of horizontal and vertical segments, whereas the dashed path is straight.

What is the difference in length between the two paths?

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

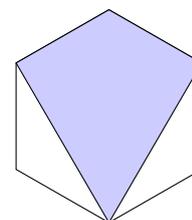


9. The value of $9 \times 1.2345 - 9 \times 0.1234$ is

- (A) 9.9999 (B) 9 (C) 9.0909 (D) 10.909 (E) 11.1111

10. What fraction of this regular hexagon is shaded?

- (A) $\frac{1}{2}$ (B) $\frac{2}{3}$ (C) $\frac{3}{4}$ (D) $\frac{3}{5}$ (E) $\frac{4}{5}$



Questions 11 to 20, 4 marks each

11. The cost of feeding four dogs for three days is \$60. Using the same food costs per dog per day, what would be the cost of feeding seven dogs for seven days?

- (A) \$140 (B) \$200 (C) \$245 (D) \$350 (E) \$420

12. In a certain year there were exactly four Tuesdays and exactly four Fridays in the month of December. What day of the week was 31 December?

- (A) Monday (B) Wednesday (C) Thursday (D) Friday (E) Saturday

13. Fill in this diagram so that each of the rows, columns and diagonals adds to 18.

What is the sum of all the corner numbers?

- (A) 20 (B) 22 (C) 23
 (D) 24 (E) 25

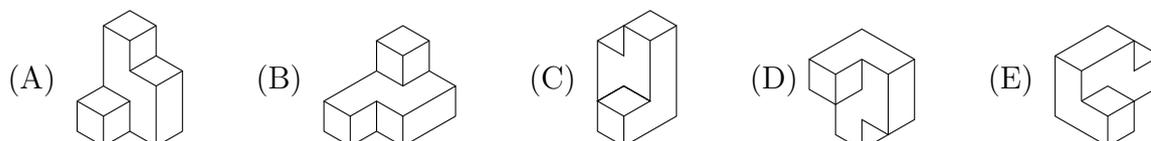
	6	
	4	

14. The sum of 4 consecutive integers is t .

In terms of t , the smallest of the four integers is

- (A) $\frac{t-10}{4}$ (B) $\frac{t-2}{4}$ (C) $\frac{t-3}{4}$ (D) $\frac{t-4}{4}$ (E) $\frac{t-6}{4}$

15. A 3-dimensional object is formed by gluing six identical cubes together. Four of the diagrams below show this object viewed from different angles, but one diagram shows a different object. Which diagram shows the different object?

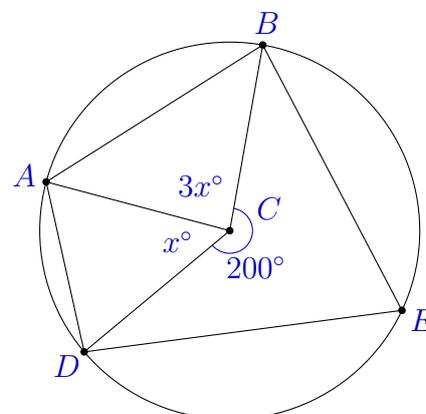


16. In the circle shown, C is the centre and A , B , D and E all lie on the circumference.

Reflex $\angle BCD = 200^\circ$, $\angle DCA = x^\circ$ and $\angle BCA = 3x^\circ$ as shown.

The ratio of $\angle DAC : \angle BAC$ is

- (A) 3 : 1 (B) 5 : 2 (C) 8 : 3
 (D) 7 : 4 (E) 7 : 3



Questions 21 to 25, 5 marks each

21. How many digits does the number 20^{18} have?

- (A) 24 (B) 38 (C) 18 (D) 36 (E) 25

22. In this subtraction, the first number has 100 digits and the second number has 50 digits.

$$\underbrace{111 \dots 111}_{100 \text{ digits}} - \underbrace{222 \dots 222}_{50 \text{ digits}}$$

What is the sum of the digits in the result?

- (A) 375 (B) 420 (C) 429 (D) 450 (E) 475

23. Suppose p is a two-digit number and q has the same digits, but in reverse order. The number $p^2 - q^2$ is a non-zero perfect square. The sum of the digits of p is

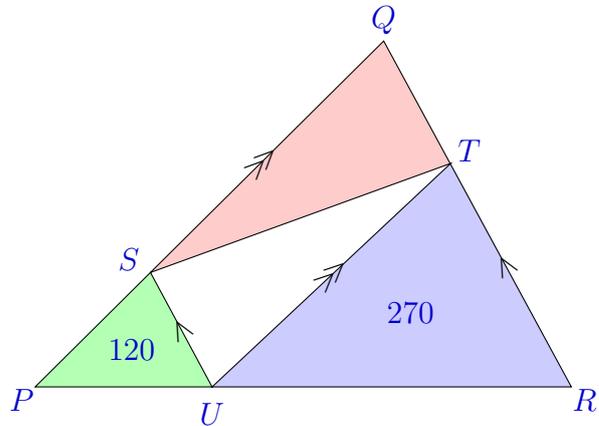
- (A) 7 (B) 9 (C) 11 (D) 12 (E) 13

24. In triangle $\triangle PQR$, U is a point on PR , S is a point on PQ , T is a point on QR with $US \parallel RQ$, and $UT \parallel PQ$.

The area of $\triangle PSU$ is 120 cm^2 and the area of $\triangle TUR$ is 270 cm^2 .

The area of $\triangle QST$, in square centimetres, is

- (A) 150 (B) 160 (C) 170
(D) 180 (E) 200



25. This year Ann's age is the sum of the digits of her maths teacher's age. In five years Ann's age will be the product of the digits of her maths teacher's age at that time. How old is Ann now?

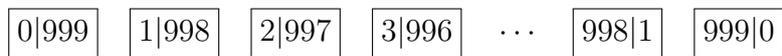
- (A) 11 (B) 13 (C) 15 (D) 14 (E) 16

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

Questions 26–30 are worth 6, 7, 8, 9 and 10 marks, respectively.

26. I have a three-digit number, and I add its digits to create its *digit sum*. When the digit sum of my number is subtracted from my number, the result is the square of the digit sum. What is my three-digit number?
-

27. A road from Tamworth to Broken Hill is 999 km long. There are road signs each kilometre along the road that show the distances (in kilometres) to both towns as shown in the diagram.



How many road signs are there that use exactly two different digits?

28. In the division shown, X , Y and Z are different non-zero digits.

$$\begin{array}{r} Z \ X \ \text{rem. } Y \\ 8 \overline{) \ X \ Y \ Z} \end{array}$$

What is the three-digit number XYZ ?

29. An infinite increasing list of numbers has the property that the median of the first n terms equals the n^{th} odd positive integer. How many numbers in the list are less than 2018?
-

30. For $n \geq 3$, a pattern can be made by overlapping n circles, each of circumference 1 unit, so that each circle passes through a central point and the resulting pattern has order- n rotational symmetry.

For instance, the diagram shows the pattern where $n = 7$.
If the total length of visible arcs is 60 units, what is n ?

