

Question One

The number of dots on opposite faces of a regular die add to 7. Four regular dice are arranged as shown. Which of the following could be the sum of the number of dots hidden between the dice?

- (A) 22 (B) 26 (C) 19 (D) 21 (E) 23

Question Two

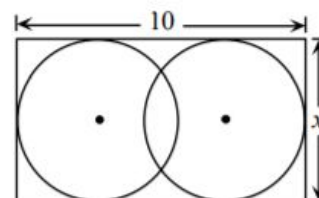
The product of 20^{17} and 17^{20} is calculated and written out fully. The number of zeros at the end of this number would be:

- (A) 17 (B) 20 (C) 34 (D) 37 (E) 40

Question Three

Two circles with equal radii are enclosed by a rectangle, as shown. The distance between their centres is $\frac{3}{7}$ of x . The value of x is:

- (A) $\frac{140}{13}$ (B) 14 (C) $\frac{67}{7}$ (D) $\frac{70}{17}$ (E) 7



Question Four

A straight one-way city street has 6 consecutive traffic lights. Every light remains green for 1.25 minutes, yellow for 5 seconds, and red for 1.25 minutes. The lights are synchronized so that each light turns red 10 seconds after the preceding one turns red. What is the longest interval of time, in seconds, during which all 6 lights are green?

- (A) 10 (B) 25 (C) 30 (D) 35 (E) 75

Question Five

There are three men in a leaking boat. The first man can bail out 10 litres of water in a minute, the second man at triple this rate, and this third man at half the second man's rate. Water is leaking into the boat at 70 litres a minute. If the boat can hold 200 litres of water before it sinks, how many seconds will it take from the time the leak started until it sinks?

- (A) 480 (B) 780 (C) 800 (D) 833 (E) 900

Question Six

Three rugs have a combined area of 400m^2 . By overlapping the rugs to cover a floor area of 280m^2 , the area covered by exactly two layers of rug is 48m^2 . What area of floor is covered by three layers of rug?

- (A) 24m^2 (B) 36m^2 (C) 48m^2 (D) 72m^2 (E) 84m^2

Question Seven

P, Q, R, S, and T are five different integers between 2 and 19 inclusive.

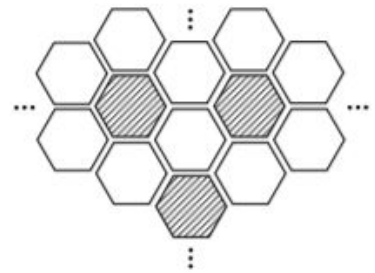
- P is a two-digit prime number whose digits also add up to a prime number.
- Q is a multiple of 5.
- R is an odd number, but not a prime number.
- S is the square of a prime number.
- T is a prime number that is also the mean of P and Q.

Which number is the largest?

- (A) P (B) Q (C) R (D) S (E) T

Question Eight

A square floor is tiled, as partially shown, with a large number of regular hexagonal tiles. The tiles are coloured blue or white. Each blue tile is surrounded by 6 white tiles and each white tile is surrounded by 3 white and 3 blue tiles. Ignoring part tiles, the ratio of the number of blue tiles to the number of white tiles is closest to:



- (A) 1:6 (B) 2:3 (C) 3:10 (D) 1:4 (E) 1:2

Question Nine

The angles of a quadrilateral are in the ratio 3 : 4 : 5 : 6. What is the difference between the largest angle and the smallest angle?

- (A) 30° (B) 40° (C) 50° (D) 60° (E) 70°

Question Ten

The combined age of Aroha and Benji is 39. The combined age of Benji and Chen is 40. The combined age of Chen and Danica is 38. The combined age of Danica and Emily is 44. The total of all five ages is 105. Which of the five is the youngest?

- (A) Aroha (B) Benji (C) Chen (D) Danica (E) Emily

Question Eleven

A sheet of graph paper is placed with its x -axis pointing due East and its y -axis pointing due North. A sluggish snail starts at point (0,0) and slowly, but smoothly, slithers 1 unit North, 2 units East, 3 units South, 4 units West, 5 units North, 6 units East, 7 units South, 8 units West, 9 units North and (lastly!) 10 units East. At which point does the snail finally arrive?

- (A) (5, 6) (B) (6, -5) (C) (6, 5) (D) (-4, 5) (E) (-1, -2)

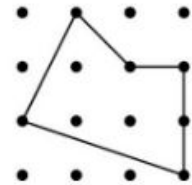
Question Twelve

Granny says "I am 84 years old - not counting my Sundays". How old is she really?

- (A) 90 (B) 91 (C) 92 (D) 96 (E) 98

Question Thirteen

A single polygon is made by joining dots in the 4x4 grid with straight lines, which meet only at dots at their end points. No dot is at more than one corner. The diagram shows a five-sided polygon formed in this way. What is the greatest possible number of sides of polygon formed by joining the dots using these same rules?



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

Question Fourteen

The expression $2017^{2017} - 1$ is calculated and written out in full. The last digit would be:

- (A) 0 (B) 2 (C) 4 (D) 6 (E) 8

Question Fifteen

Two brothers and three sisters form a single line for a photograph. The two boys refuse to stand next to each other. How many different line-ups are possible?

- (A) 72 (B) 36 (C) 60 (D) 120 (E) 24