

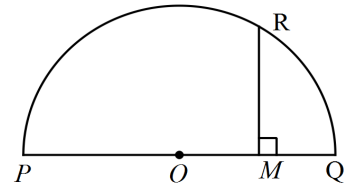
Question 1:

When I recently bought some square floor tiles, I noticed that each square metre of tiles (the tiles needed to cover 1m^2), came packed with the tiles stacked one on top of the other to form a cube. My tiles have a side length of 200mm. What is the thickness, in millimetres, of each tile?

- A. 5 B. 8 C. 10 D. 12 E. 15
-

Question 2:

A semicircle PQR on PQ as diameter, has centre O . M is the midpoint of OQ and RM is perpendicular to PQ . The ratio of $PR : RM$ has value



- A. 2 B. $\sqrt{3}$ C. $\sqrt{5}$ D. $\frac{7}{4}$ E. $\frac{3\sqrt{7}}{5}$
-

Question 3:

By placing a 1 at both ends of a number, the value is increased by 14,789. What is the sum of the digits of the original number?

- A. 11 B. 10 C. 9 D. 8 E. 7
-

Question 4:

Five numbers are represented by $\{p, q, r, s, t\}$. The mean of p, q and r is 8. The mean of p, q, r, s and t is 7. The mean of s and t is

- A. 4.5 B. 5 C. 5.5 D. 6 E. 6.5
-

Question 5:

How many years in the 21st century will have the property that, dividing their year number by each of 2, 3, 5 and 7 always leaves a remainder of 1?

- A. 0 B. 1 C. 2 D. 3 E. 4
-

Question 6:

A triangle PQR is to be formed having all sides of integer length. If $PQ = 2016$ and $QR = m$, where m is a fixed integer less than 37, how many different lengths are possible for PR ?

- A. m B. $2m + 1$ C. $2m$ D. $2m - 1$ E. $2m - 2$
-

Question 7:

If m is an odd number and n is an even number, which of the following will be an odd number?

- A. $3m + 4n$ B. $4m + 3n$ C. $2m + 5n$ D. $4m + 2n$ E. $6(m + n)$
-

Question 8:

The area, in units², enclosed by the graphs of $x + y = 6$, $y = 4$, $x = 0$ and $y = 0$ is

- A. 8 B. 16 C. 17 D. 18 E. 36
-

Question 9:

If $pq = 21$, $qr = 132$, and $pr = 77$, and $p > 0$, then p equals

- A. $\frac{49}{4}$ B. $\frac{4}{49}$ C. $\frac{11}{4}$ D. $\frac{2}{7}$ E. $\frac{7}{2}$
-

Question 10:

The greatest value of $1 - 2 \cos A$ is

- A. 5 B. 3 C. 1 D. 0 E. -1
-

Question 11:

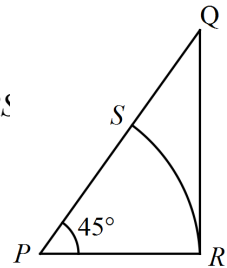
The largest divisor of 72^3 , other than itself is

- A. $2^9 \times 3^5$ B. $2^8 \times 3^6$ C. $2^8 \times 3^5$ D. $2^5 \times 3^5$ E. $2^6 \times 3^6$
-

Question 12:

In the right-angled triangle PQR , $\angle QPR = 45^\circ$, and the arc, centre P and radius PR , cuts PQ at S . The ratio of the area PRQ to the area of RSQ is

- A. $\frac{\pi}{2+\pi}$ B. $\frac{\pi}{\pi-2}$ C. $\frac{\pi}{4+\pi}$ D. $\frac{\pi}{4-\pi}$ E. $\frac{\pi}{8-\pi}$



Question 13:

The straight line through the points $(16, 0)$ and $(0, 10)$ also passes through the point $(x, 4)$. The value of x is

- A. 6.4 B. 9.6 C. 3.2 D. 8 E. 8.8
-

Question 14:

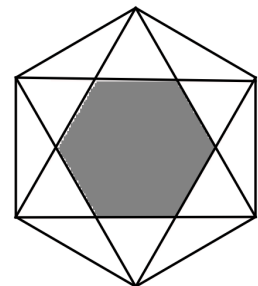
If α, β are the roots of $x^2 - 10x + 21 = 0$, then $\alpha^2 + \beta^2$ equals

- A. 10 B. 100 C. 58 D. 29 E. 65
-

Question 15:

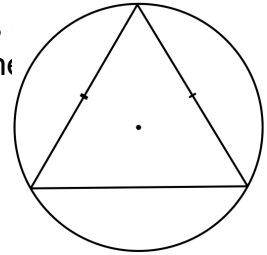
Alternate vertices of a regular hexagon are joined as shown. What fraction of the total area of the hexagon is shaded?

- A. $\frac{1}{3}$ B. $\frac{1}{2}$ C. $\frac{1}{\sqrt{3}}$ D. $\frac{4}{9}$ E. $\frac{\sqrt{2}}{\sqrt{3}}$



Question 1:

PQR is an isosceles triangle with a base of 18cm and equal sides 15cm and is inscribed in a circle as shown. The radius, in centimetres, of the circle shown is



- A. 9.25 B. 9 C. 9.375 D. 8.75 E. 8.875
-

Question 2:

If $\frac{1+2+3+4+\dots+n}{3n} = 36$, the value of n is

- A. 215 B. 195 C. 185 D. 205 E. 225
-

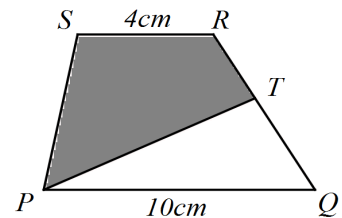
Question 3:

How many positive integers have a remainder of 4 when divided into 100?

- A. 9 B. 12 C. 6 D. 7 E. 8
-

Question 4:

The lines PQ and SR are parallel and 6cm apart. T is the midpoint of QR . The area, in square centimetres, of the shaded region is



- A. 21 B. 26 C. 27 D. 34 E. 42
-

Question 5:

The vertices of a cube are labelled from 1 to 8, in such a way that the sets of numbers corresponding to the vertices of the six faces are

$\{1, 2, 6, 7\}$, $\{1, 4, 6, 8\}$, $\{1, 2, 5, 8\}$

$\{2, 3, 5, 7\}$, $\{3, 4, 6, 7\}$ and $\{3, 4, 5, 8\}$. The vertex labelled 6 is furthest from the vertex labelled

- A. 1 B. 3 C. 4 D. 5 E. 7
-

Question 6:

A motel cleaner has 8 master keys at home to open all the rooms in a large motel. Each room can be opened by just one of these keys. If 40% of the rooms are left unlocked, what is the probability that the cleaner can get into a specific room if he selects three keys at random before leaving home to go to work?

- A. $\frac{5}{8}$ B. $\frac{5}{16}$ C. $\frac{31}{40}$ D. $\frac{3}{20}$ E. $\frac{19}{40}$
-

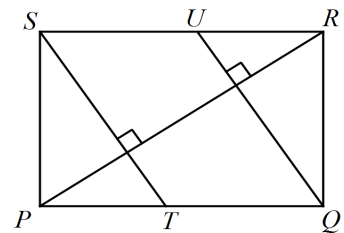
Question 7:

At a school play adults were charged 75 cents and students 25 cents to get in and \$330 was collected in total receipts. The play was held in a 600 seat school hall that was not filled. The minimum number of adults at the play was

- A. 359 B. 300 C. 365 D. 361 E. 367
-

Question 8:

In the rectangle shown to the right, ST and UQ are perpendicular to PR . If $PQ = 18$ and $QR = 12$, then the area of the parallelogram $TQUS$ is



- A. 118 B. 110 C. 120 D. 121 E. 122
-

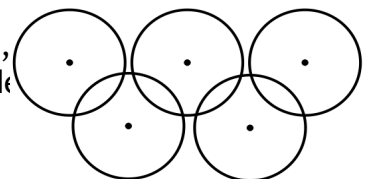
Question 9:

What is the largest possible remainder when a two-digit number is divided by the sum of its digits?

- A. 13 B. 14 C. 15 D. 16 E. 17
-

Question 10:

Five circles of radius 1 are laid out like the Olympic rings, that one sixth of the circumference of each circle is inside adjoining circle. The area covered by the five circles is



- A. $5\pi - \frac{\sqrt{3}}{2}$ B. $4\pi - \frac{3\sqrt{3}}{2}$ C. $\frac{25\pi}{6} + 2\sqrt{3}$ D. 5π E. $\frac{11\pi}{3} + 2\sqrt{3}$

Question 11:

Two athletes are competing in the 10,000 metre race, on a 400 metre track, at the Rio Olympics. One is known to run 60 second laps while the other runs 68 second laps. On which of his laps would the faster runner overtake the slower runner?

- A. 6th B. 7th C. 8th D. 9th E. 10th
-

Question 12:

Two players compete in a tennis match of up to three sets. The match ends when a player wins two sets. If player A has probability of 60% of winning a set, what is this player's probability of winning the match?

- A. 0.6 B. 0.648 C. 0.504 D. 0.36 E. 0.75
-

Question 13:

The perimeter of a regular hexagon is 12cm. The area of the hexagon, in square centimetres, is

- A. $6\sqrt{3}$ B. $4 + 2\sqrt{3}$ C. 24 D. 12 E. $12\sqrt{3}$
-

Question 14:

The graph of $y = 3x^2 - kx + 2$ is symmetrical about the line $x = \frac{1}{2}$. What is the minimum value of y ?

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

Question 15:

The mean of n numbers is k . When another number x is added to the set, the mean increases by 1. The value of x is

- A. $k + n + 1$ B. $k + 1$ C. n D. $k + n$ E. $\frac{n(k + 1)}{n + 1}$
