

Question 1:

Evaluate $\left[\left(\frac{2018+2018}{2018} \right)^{-1} - \left(\frac{2019}{2019+2019} \right)^{-1} \right]^{-2}$

Question 2:

The difference between the squares of two numbers is 80. If the sum of the two numbers is 16, what is the positive difference between the two numbers?

Question 3:

The five interior angles in a pentagon are in the ratio 2 : 3 : 4 : 5 : 6. What is the size of the pentagon's largest angle?

Question 4:

If the lines $2x - 5y = 7$ and $10x + by = 7$ are perpendicular, what is the value of b ?

Question 5:

What length of the line $y = \frac{4}{3}x - 8$ lies within the 4th quadrant?

Question 6:

Miss Sun's fruit bowl contains apples, bananas and pears. There are 20% more pears than apples, and the ratio of apples to bananas is 3 : 4. What is the minimum number of pears that could be in Miss Sun's fruit bowl?

Question 7:

How many three-digit numbers have no two digits the same?

Question 8:

Find all values of x such that $\frac{3^{x^2}}{3^{2x}} = 27$

Question 9:

For what value of b is $x = 3$ a solution to the equation $bx^2 + 3x - 2b = 0$?

Question 10:

If a is a constant such that $9x^2 + 24x + a$ is a perfect square, what is the value of a ?

Question 11:

A Year 11 Mathswell student walked at a certain distance at a constant speed. If she had gone 0.5 km/hr faster, she would have walked the distance in four-fifths of the time; if she had gone 0.5 km/hr slower, it would have taken her an additional 2.5 hours.

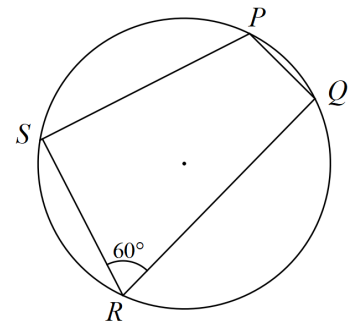
How far did the Mathswell student walk?

Question 12:

Points P , Q , R and S lie on a circle and angle $SRQ = 60^\circ$.

$RS = 4$, $RQ = 6$, $SP = x$ and $PQ = y$.

Given x and y are positive integers and that $x > y$, what is the value of $x - y$?



Question 13:

What is the height of a STOP sign (regular octagon) whose edges are 1 cm long?

Question 14:

Three numbers are added two at a time, the sums are 29, 46 and 53. What is the sum of all three numbers?

Question 15:

A Year 11 student sits a Mathematics test which has two parts. The first part is worth 60% and the second part is worth 40%. If the student gets 95% of part one correct, what exact percent correct must the student achieve in part two of the test, in order to have a mean of 90% for the entire test?

Question 16:

Two digits between 1 and 9, inclusive, are selected at random. The same digit can be selected twice. What is the probability that their product is a multiple of 3?

Question 17:

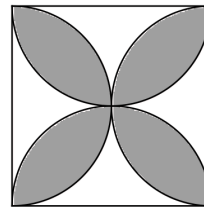
The surface area of a cube is numerically equal to twice its volume.
What is the length of the diagonal of each face of the cube?

Question 18:

Given $ABCDEF$ is a regular hexagon with edges of length 6 cm, what is the area of triangle BCE ?

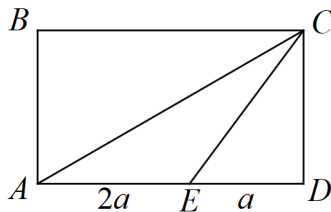
Question 19:

Given a square with edge length 4cm and four semicircles which have the edges of the square as their diameters, as shown in the figure, find the area of the 'leaves' which are the shaded in the diagram.



Question 20:

Find the ratio of the area of triangle ACE to the area of rectangle $ABCD$, expressed as a fraction.



Question 21:

If $a, b > 0$ and the triangle in the first quadrant bound by the coordinate axis and the line $ax + by = 6$, has an area of 6 units², what is the value of ab ?

Question 22:

What is the radius of the circle that is inscribed inside a triangle whose perimeter is 40cm and area is 120cm² ?

Question 23:

Find the value of A , if the five-digit number $12A3B$ is divisible by both 4 and 9, given $A \neq B$.

Question 24:

Figure $ABCD$ is a trapezium with AB parallel to DC .

With $AB = 5$, $BC = 3\sqrt{2}$, what is the length of DC ?

