

**Question 1:**

A regular polygon has interior angles measuring  $179^\circ$  and has edges of length 2cm. What is its perimeter?

**Question 2:**

What is the sum of the factors of 378?

**Question 3:**

What is the smallest five-digit number that is divisible by both 8 and by 9?

**Question 4:**

Three fair dice are rolled simultaneously. What is the probability that exactly two of the dice show a 6?

**Question 5:**

On a clock face, a line is drawn between 9 and 3 and another between 12 and 8. What is the acute angle between these two lines?

**Question 6:**

In the expression below, the letters  $A$ ,  $B$ ,  $C$ ,  $D$  and  $E$  represent the numbers 1, 2, 3, 4, and 5 in some order.

$$A \times B + C \times D + E$$

What is the largest possible value of the expression?

**Question 7:**

Anine has four children of different ages, all under 10, and the product of their ages is 2016. What is the sum of their ages?

**Question 8:**

What is the smallest number  $N$  for which  $\frac{2016}{N}$  is a perfect square?

**Question 9:**

Five people are sitting around a circle. Some are always telling the truth, whilst others always lie. Each person claims to be sitting between two liars. How many of them are telling the truth?

**Question 10:**

A packet of lollies contains 5 blue lollies, 15 yellow lollies and some red lollies. One-third of the lollies are red. What fraction of the lollies are yellow?

**Question 11:**

In a singles tennis tournament there are 10 players. The organiser needs to arrange these 10 players into 5 pairs for the first round. In how many ways can this first round be drawn up?

**Question 12:**

The wheels on a truck travelling at 60 km/hr make 3 revolutions per second. What is the diameter of each wheel in metres?

**Question 13:**

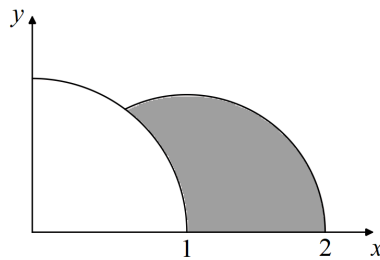
A student noticed that in a list of five integers, the mean, median and mode were consecutive integers in ascending order. What is the largest range possible for these five integers?

**Question 14:**

There is enough food in a pig pen to feed 14 pigs for 16 days.  
For how many days should this amount feed 8 pigs?

**Question 15:**

The diagram shows two circles, each of radius 1 unit, and having its centre on the  $x$ -axis.  
Find the shaded area?



**Question 16:**

Two missiles are initially 5,000km apart. They travel along a straight line directly towards one another, one travelling at 2,000km/hr and the other at 1,000km/hr.  
How many kilometres are they apart one minute before impact?

**Question 17:**

If  $p$  is 50% of  $q$  and  $r$  is 40% of  $q$ , what percent is  $r$  of  $p$ ?

**Question 18:**

What is the value of  $n$ , if 1 minus the reciprocal of  $(1-n)$  equals the reciprocal of  $(1-n)$ ?

**Question 19:**

What is the mean of 7 numbers, if the mean of the first two is 9 and the mean of the last five is 16?

**Question 20:**

How many four-letter “words” are there with vowels in the middle two places and consonants in the other two, with no letter repeated?

**Question 21:**

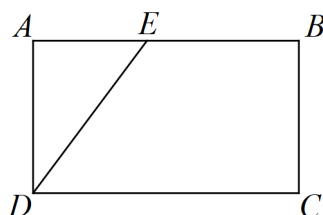
What is the value of  $x$ , if  $2^{16^x} = 16^{2^x}$  ?

**Question 22:**

If  $x \phi y$  is defined as  $x \phi y = \frac{1/x + 1/y}{x + y}$ , what value of  $\frac{3 \phi 5}{5 \phi 7}$  ?

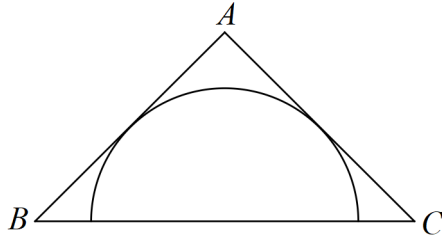
**Question 23:**

$ABCD$  is a rectangle with  $DE = DC$ . Given  $AD = 5$  units and  $BE = 3$  units, what is the length of  $DE$ ?



**Question 24:**

Find the area of a semicircle inscribed in triangle  $ABC$ , where  $AB = AC = 25$  units and  $BC = 40$  units.



**Question 25:**

The area of a circle circumscribed about a regular hexagon is  $2\pi$  units<sup>2</sup>.  
What is the area of the hexagon?

**Question 26:**

Two candles have different lengths and thicknesses. The longer one can burn for 6 hours and the shorter one for 10 hours. After 4 hours of burning, both candles are the same length.

What fraction of the longer candle's length was the shorter candle's length?