

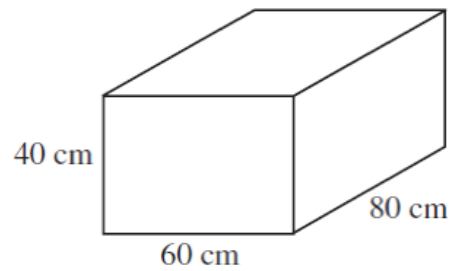
**Question 1:**

The value of  $x$  in the sequence, 9, 27, 81, 243,  $x$  is

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**Question 2:**

What is the maximum number of rectangular wooden blocks with dimensions  $20\text{ cm} \times 20\text{ cm} \times 30\text{ cm}$  that could fit into a rectangular box with inner dimensions  $40\text{ cm} \times 60\text{ cm} \times 80\text{ cm}$ ?



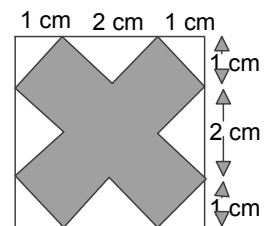
**Question 3:**

How many odd whole numbers lie between  $3^2$  and  $3^3$ ?

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**Question 4:**

A square contains a cross as shown in the diagram on the right.  
Find the area (in square centimetres) of the shaded cross.



**Question 5:**

A full jug can fill 9 small glasses and 4 large glasses of lemonade or fill 6 small glasses and 6 large glasses. If the full jug is used to fill only large glasses, the maximum number of large glasses that can be filled is

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**Question 6:**

It takes Wills 35 minutes to drive the 36 km from his home to work. His drive includes 20 minutes on a motorway and 15 minutes on urban roads. If his average speed when he is on urban roads is 32 km/h, the average speed, in km/h, at which he drives on the motorway, is

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**Question 7:**

Two positive integers have a sum of 13. The greatest possible product of these two positive integers is

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**Question 8:**

A code is made out of the alphabet by assigning a numerical value to each letter. A numerical value is given to a word by adding up the numerical values of the letters in the word. Using this code, the numerical values for BAT is 6, CAT is 8 and CAR is 12. Using this code, what is the numerical value of BAR?

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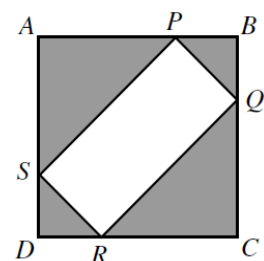
**Question 9:**

If  $a$ ,  $b$  and  $c$  are positive integers with  $a \times b = 13$ ,  $b \times c = 52$ , and  $c \times a = 4$ , the value of  $a \times b \times c$  is

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**Question 10:**

In the diagram, two pairs of identical isosceles triangles are



cut off of square ABCD, leaving rectangle PQRS. The total area cut off is  $200 \text{ m}^2$ . The length of QS, in metres, is

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**Question 11:**

The digits 5, 6, 7, 8 and 9 can be arranged to form *even* five-digit numbers. What is the tens digit in the largest of these numbers?

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**Question 12:**

A cube with an edge length of 2 metres is cut up into cubes with edge length 4 centimetres. If all these cubes were stacked up one on top of the other to form a tower, what would the height of the tower be in kilometres?

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**Question 13:**

The difference between a number and its reciprocal is  $\frac{9}{20}$ .

The sum of the number and its reciprocal is

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**Question 14:**

$$1 \times 2 \times 3 \times 4 \times 5 \times 6 = 8 \times 9 \times 10$$

$8 \times 9 \times 10 \times 11 \times 12 \times 13 \times 14$  is equal to another such product of consecutive whole numbers.

What is the largest number in this other product?

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**Question 15:**

Each of the vertices of a square  $PQRS$  is given a number. For each of the sides of the square the sum of the numbers at its endpoints is calculated. If for  $PQ$  this sum is 5, for  $QR$  it is 6 and for  $RS$  it is 11, what is the sum for  $PS$ ?

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**Question 16:**

Five bales of wool are weighed two at a time in all possible combinations.

The weights, in kilograms, are:

110, 112, 113, 114, 115, 116, 117, 118, 120 and 121

What is the weight, in kilograms, of the lightest bale?

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**Question 17:**

A right angled triangle has a perimeter of 56 cm and an area of 84 cm<sup>2</sup>.

The length of the shortest side, in centimetres, is

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**Question 18:**

The geometric mean of two numbers  $a$  and  $b$  is defined as  $\sqrt{ab}$ .

What is the geometric mean of 9 and 25?

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**Question 19**

Alpha, Beta and Gamma each think of a four-digit number. Alpha's first digit is the same as Gamma's last, and his last digit is the same as Gamma's first, and they have the same digits in the middle. Alpha's number and Beta's number add up to Gamma's number.

Beta's two middle digits are the same and are also the same as Gamma's first digit, and his first digit as the same as Alpha's. What is Beta's number?

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**Question 20:**

"The man in the middle is Hal."

"I'm Gene."

"The man in the middle is Bill."

If Hal always tells the truth, but Gene and Bill never do, then put the names of the people correctly in the boxes.

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**Question 21:**

At the school gala visitors were asked to guess the number of jelly beans in the jar. Prizes were awarded on how close the guesses were to the exact number.

1<sup>st</sup> prize was awarded to the person who guessed 286 jelly beans; 2<sup>nd</sup> prize to a guess of 309; 3<sup>rd</sup> prize to a guess of 312 and 4<sup>th</sup> prize to a guess of 280

How many jelly beans were in the jar?

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**Question 22:**

Sarah added all the heights of the pupils in her class together and found that the total was 47.12 m. She calculated the average height as 152 cm tall.

How many pupils were there in the class?

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**Question 23:**

A bricklayer can build a brick wall in 9 hours and his apprentice can build the same wall in 10 hours. When they work together they lay 10 fewer bricks per hour that they both could lay working separately. Working together they could build the same wall in 5 hours. How many bricks did they lay?

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**Question 24:**

A new garden is being laid out. It is to be rectangular in shape and 55 metres long, but no width has been decided. A square grassed area is to be placed in the middle of the length, and is to fill the full width of the space, leaving a paved area at each end as shown in the diagram. To get the largest possible paved area, what should be the width (in metres) of the grassed area?



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**Question 25:**

If  $(1 + 3 + 5 + \dots + p) + (1 + 3 + 5 + \dots + q) = (1 + 3 + 5 + \dots + 25)$ ,  
what is the value of  $p + q$ ?

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