



UKMT Team Maths Challenge 2010 : Regional Final Relay Race



# A1

All of the integers from 1 to 100 inclusive are written down.

How many times does the digit 1 (one) appear?



Answer



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# A2

What is the value of:

number of sides of 9 heptagons + number of sides of 2 dodecagons?



Answer



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# A3

Before decimalisation, British money had pounds, shillings and pence, with 20 shillings in a pound and 12 pence in a shilling.

How much change would I get from a five pound note if my bill was two pounds, four shillings and seven pence?

Answer  pounds,  shillings and  pence



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# A4

I am a three digit number.

All my digits are different.

The sum of my digits is 6.

My tens digit is greater than my units digit.

My tens digit and my units digit in that order form a two-digit prime number.

Who am I?



Answer



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# A5

A drink is made from orange juice, lime juice and lemonade in the ratio 5:1:20 respectively.

How much of the drink can I make if I have 80ml of orange juice, 18ml of lime juice and 350 ml of lemonade?



Answer

ml



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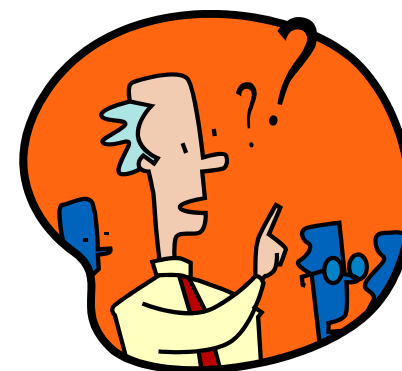


# A6

Five different whole numbers have a mean and median of 6 and a range of 8.

Three of the numbers are prime.

What are the five numbers?



Answer

\_\_\_\_\_ , \_\_\_\_\_ , \_\_\_\_\_ , \_\_\_\_\_ , \_\_\_\_\_



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# A7

A worker earns £26000 per year. Calculate his monthly pay after deducting 22% tax.



Answer £



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# A8

Mark runs the first lap of a race at 3km/hr and the second lap at 6km/hr. What was his average speed over the course of the race?



Answer

km/hr



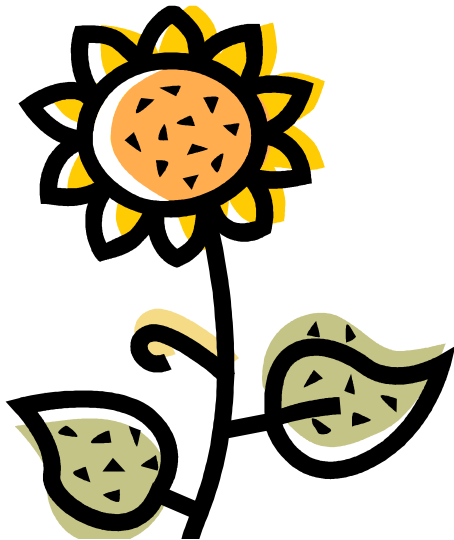
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# A9

A sunflower in my garden doubles its height every 24 hours.

It is 1.5 metres tall just before midnight on Sunday.  
On which day did it measure 10cm?



Answer



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# A10

The letters of the word “supercalifragilisticexpialidocious” are written on tiles and placed in a bag. One tile is taken out at random. What is the probability that it is a vowel?



Answer



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# A11

Sue and Ann share a packet of sweets.

Ann eats a third of the sweets and Sue eats three quarters of the rest.

Six sweets are left in the packet. How many were there when it was full?



Answer

sweets



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# A12

For his yearly wages a medieval servant was promised 100 ducats and a cloak.

However, the servant left his master's house after only 7 months and received 20 ducats and the cloak as his due.

How much was the cloak worth?



Answer

ducats



# A13

A gardener puts edging all round a rectangular lawn 11 metres wide and 16 metres long, and around the circular pond, radius 3 metres, in the middle. The edging is sold in multiples of 5 metres. How many metres must she buy?



Answer

metres



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# A14

If  $\frac{1}{a} = \frac{2}{3} + \frac{3}{2}$  what is the value of  $a$ ?



Answer



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# A15

How many days, to the nearest day, are there in a million seconds?



Answer

days



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# B1

Four clocks all give different times. I know that one is accurate, one 5 minutes slow, one 5 minutes fast and one 15 minutes fast.

They show 5:59, 5:54, 5:49 and 6:09.

What is the correct time?



Answer



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# B2

Find the sum of all the interior angles of a triangle, a pentagon and a hexagon.

Answer

degrees



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# B3

What percentage of the numbers from 1 to 25 inclusive are primes?



Answer

%



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# B4

All of the numbers from 100 to 300 inclusive are written down.

How many times does the digit 6 appear?



Answer

times



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# B5

Paul and his friend share a litre bottle of water. Paul drinks  $\frac{1}{5}$  of the bottle and his friend drinks  $\frac{3}{10}$  of the remainder. What fraction is left?



Answer



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# B6

Calculate  $\frac{1^2 + 2^2 + 3^2 + 4^2}{1^3 + 2^3 + 3^3 + 4^3}$  .



Answer



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# B7

Before decimalisation, British money had pounds, shillings and pence, with 20 shillings in a pound and 12 pence in a shilling.

How much change would I get from a ten pound note if my bill was six pounds, fourteen shillings and three pence?

Answer  pounds,  shillings and  pence



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# B8

In 8 years from now Sam will be three times as old as he was 12 years ago. What is his age now?



Answer



# B9

On my walk I counted 12 people each walking 1 dog, 3 people walking 2 dogs and 1 person walking 4 dogs. All the other dog-walkers had 3 dogs, and the mean number of dogs per walker was 2. How many dog-walkers did I meet altogether?

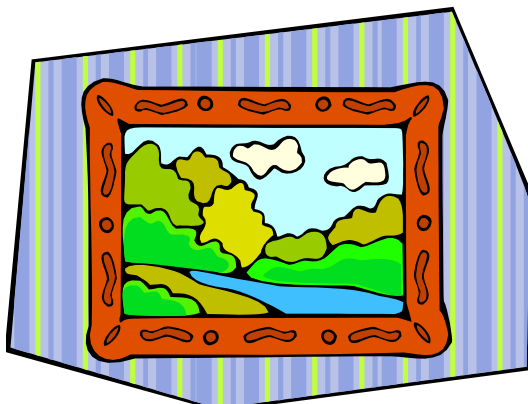


Answer



# B10

A man bought a picture. He expected to sell it at a 10% profit on his purchase price. However, he had to sell it for £500 less than his expected selling price and as a result made a loss of 15% on what it cost him. How much did he pay for the picture?



Answer £



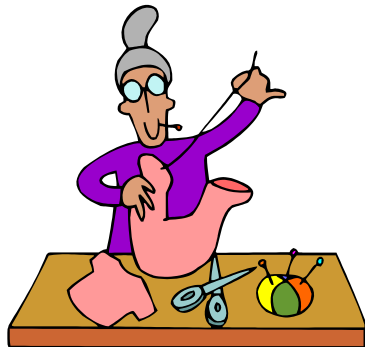
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# B11

A mathematical grandmother decorates a rectangular quilt 90cm long and 60cm wide for her new grandson with braid, which is sold in multiples of 50cm. The braid goes all around the edge and along both diagonals.

How much must she buy?



Answer

cm



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# B12

What is one tenth of one fifth of one half of £250?

Answer £



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# B13

Find the values of the numbers  $A$ ,  $B$ ,  $C$ ,  $D$  and  $E$ .

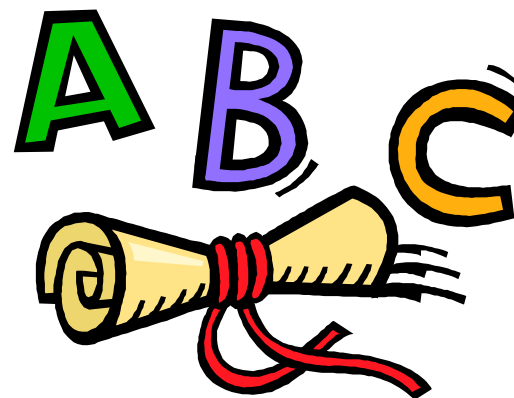
$$2A + B = 100$$

$$B = 2A$$

$$C + 2D = B$$

$$A = D + E$$

$$4E = D$$



Answer

$A$  \_\_\_\_\_ ,  $B$  \_\_\_\_\_ ,  $C$  \_\_\_\_\_ ,  $D$  \_\_\_\_\_ ,  $E$  \_\_\_\_\_

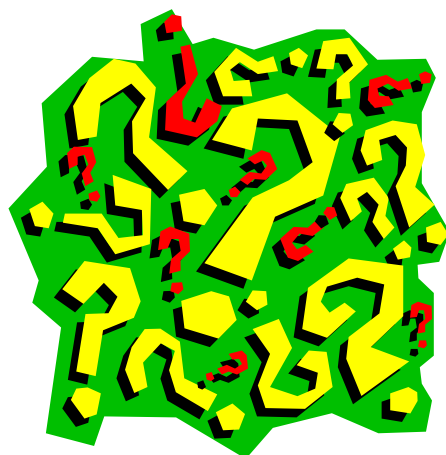


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# B14

How many years, to the nearest ten years, are there in a million hours?



Answer

years



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# B15

What is the value of:

$$\frac{1}{3} + \frac{1}{4} + \frac{1}{5} + \frac{1}{9} + \frac{1}{12} + \frac{1}{15}$$

Give your answer as a simplified fraction.



Answer