

Ratio and algebra (Junior UKMT)

These questions must be attempted without a calculator

Topics covered in the questions below may not necessarily be from the topic of the title.

- In music, a demisemiquaver is half of half of half a crotchet, and there are four crotchets in a semibreve.

How many demisemiquavers are there in a semibreve?

A 8 B 16 C 32 D 64 E 128
- Peg has six times as much chocolate as Reg. Meg has twice as much chocolate as Reg. Peg has how many times as much chocolate as Meg?

A Three times as much B Four times as much C Eight times as much
D Ten times as much E Twelve times as much
- "My car uses just 8 litres per 100km", boasted Jim. "Mine does 540km on a full 45 litre tank", said Kim. "Mine does 13km per litre", said Lim. Write J (Jim), K (Kim), and L (Lim) in order to represent the three cars – with the most economical car first and the least economical last.

A KJL B LKJ C JKL D LJK E KLJ
- A 'Supertape' plays for 6 hours. It rewinds 18 times as quickly as it plays.

How many minutes does it take to rewind a Supertape completely?

A 3 B 18 C 20 D 108 E 180
- King Harry's arm is twice as long as his forearm, which is twice as long as his hand, which is twice as long as his middle finger, which is twice as long as his thumb. His new bed is as long as four arms.

How many thumbs length is that?

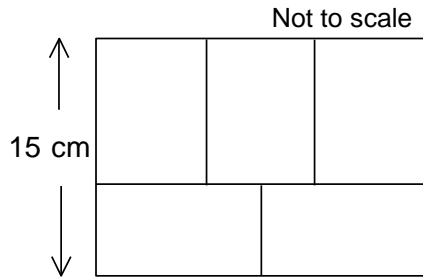
A 16 B 32 C 64 D 128 E 256
- Gill has recently moved to a new house, which has a three-digit number. The sum of this number and its three individual digits is 429.

What is the *product* of the three digits which make up the house number?

A 20 B 28 C 30 D 36 E 48

7. Five identical rectangles fit together as shown.

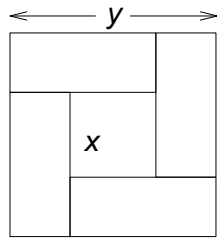
What, in cm^2 , is the total area which they cover?



- A 270 B 300 C 330 D 360 E 450

8. The diagram shows a square with sides of length y divided into a square with sides of length x and four congruent rectangles.

What is the length of the longer side of each rectangle?

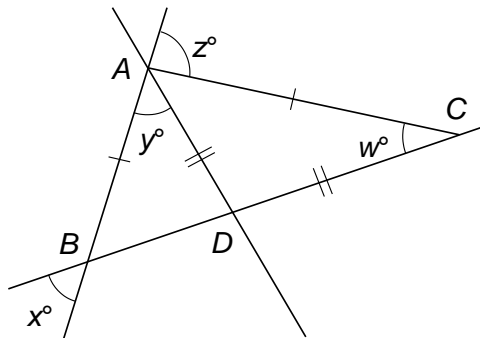


- A $\frac{y-x}{2}$ B $\frac{y+2x}{3}$ C $y-x$ D $\frac{2y}{3}$ E $\frac{y+x}{2}$

9. In the diagram below $AB = AC$, and $AD = CD$.

How many of the following statements are true for the angles marked?

$w = x$ $x + y + z = 180$ $z = 2x$



- A all of them B two C one D none of them E it depends on x

10. At a holiday camp, the ratio of boys to girls is 3:4 and the ratio of girls to adults is 5:7.

What is the ratio of children to adults at the camp?

- A 4:5 B 5:4 C 12:7 D 15:28 E 21:20