

Problem Solving GCSE

Questions 12

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(1) In an office there are 100 people in total.

$\frac{1}{4}$ of the people in the office bike to work.

The ratio of men biking to women biking to work is 3:2

The number of women coming by bus is twice the number of women who come by bike.

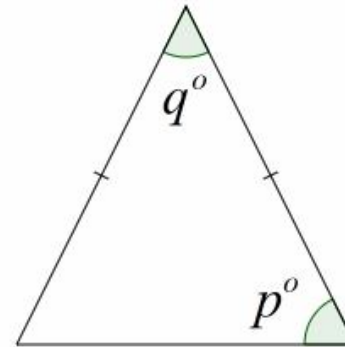
35 people walk and of those 12 are men.

Find the number of men who catch the bus to work.

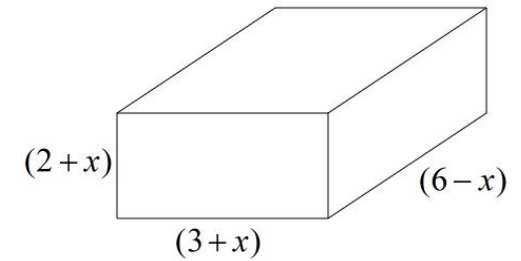
(2) A stopwatch loses time at the rate of 1 second every 10 seconds.

Bob reads the stopwatch and it says 2 minutes and 6 seconds. How much time has actually passed?

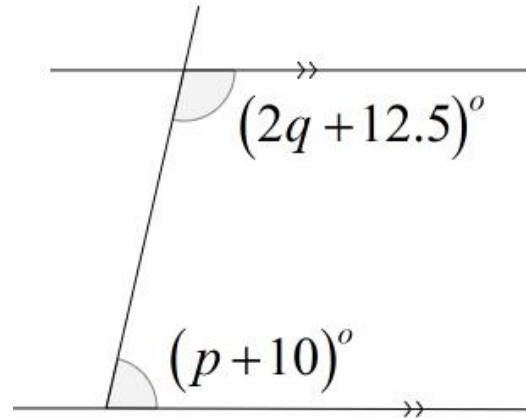
(3) Find the value of p and the value of q in the diagram below.



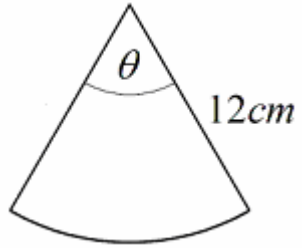
(4) (a) Find an expression for the volume of the cuboid below in terms of x .



(b) Find the difference in the surface area of the box when $x = 2$ and when $x = 4$.

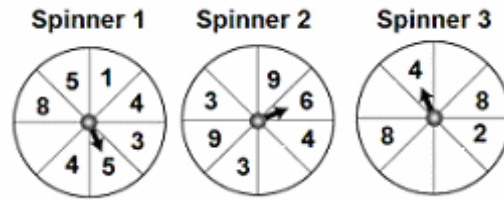


(5) The area of the sector below is $24\pi\text{cm}^2$.



Find the perimeter of the sector.

(6) The 3 spinners below are each spun once and the number written down.

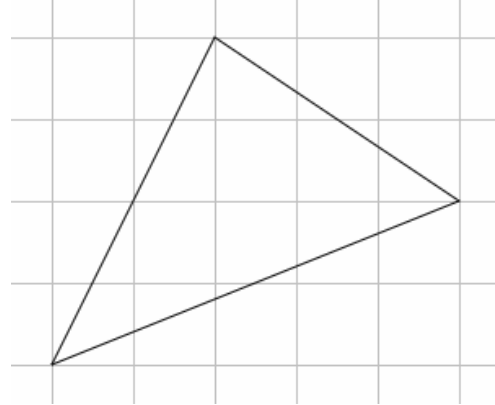


The probability of spinning a prime number on each of the spinners is given as:

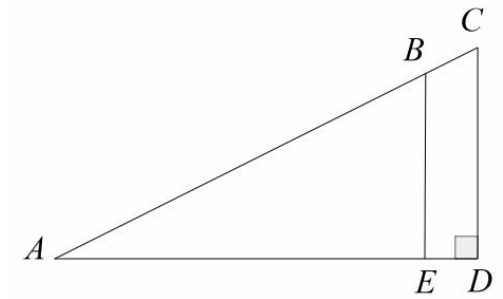
$$\frac{1}{2} \times \frac{1}{2^2} \times \frac{1}{2^3} = \frac{1}{2^5}$$

Complete the missing sections on the spinners to make this calculation true.

(7) Find the area of the triangle below.



(8) Triangle ACD and triangle ABE are mathematically similar.



Angle $CAD = 32^\circ$

$AC = 9\text{cm}$

$6BE = 5CD$

Find the length of AE giving your answer to 3 significant figures.