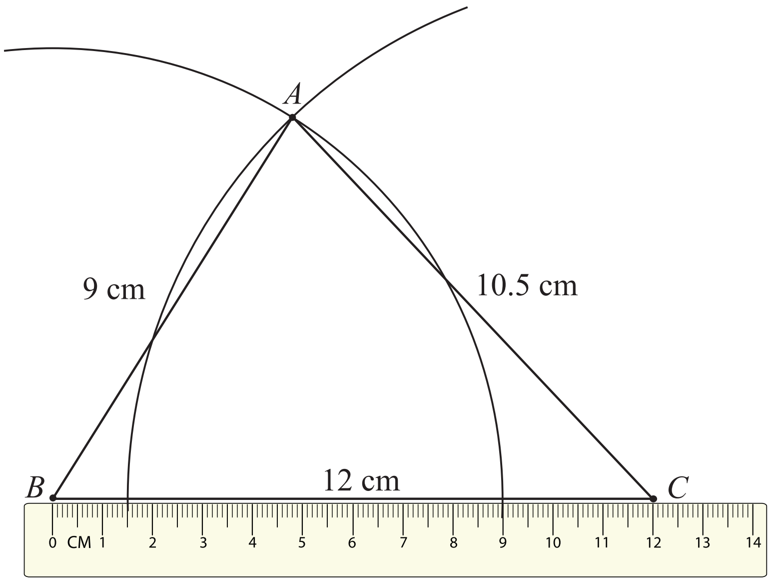
Sample Paper 5: Paper 2

Question 6 (25 marks)

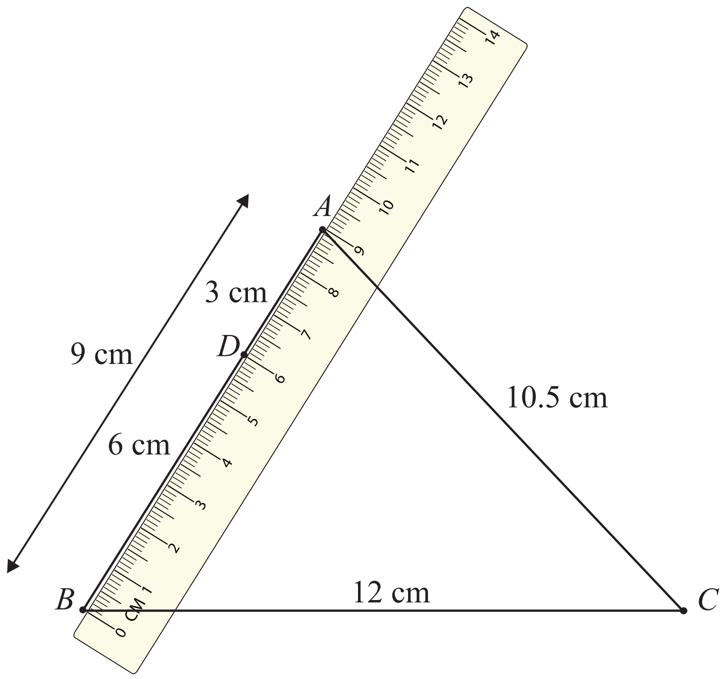
Question 6 (a)



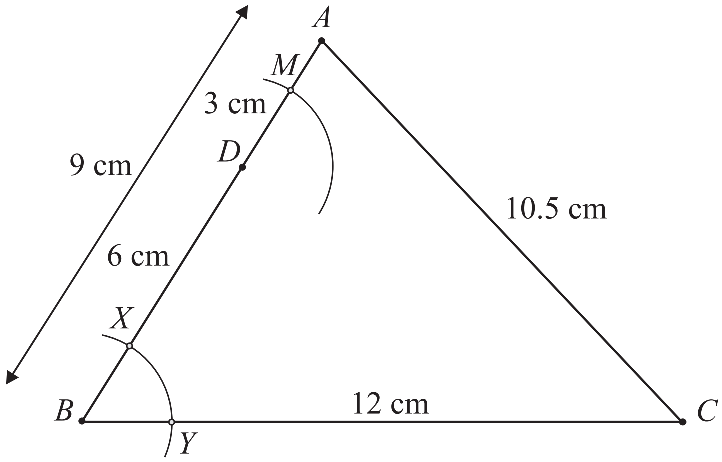
Rule out a line [*BC*] of length 12 cm.
Using a compass, draw an arc of length 9 cm with *B* as centre.
Using a compass, draw an arc of length 10.5 cm with *C* as centre.
A is the point of intersection of these arcs.
Join *B* to *A* and *C* to *A* to complete the construction.

Question 6 (b)

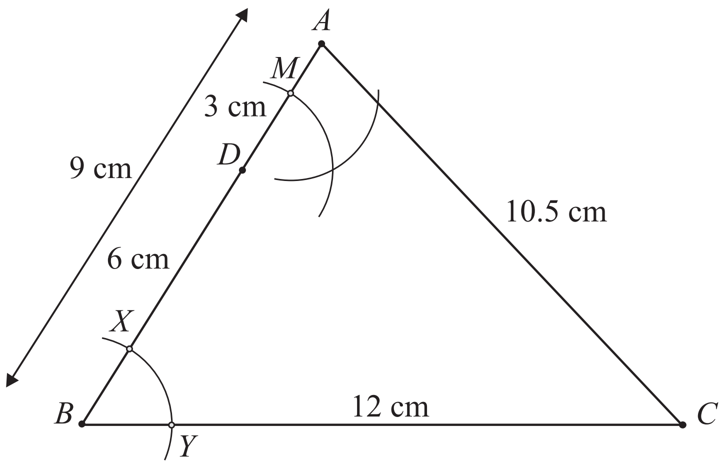
Step 1: Measure out a line segment [*BD*] of length 6 cm.



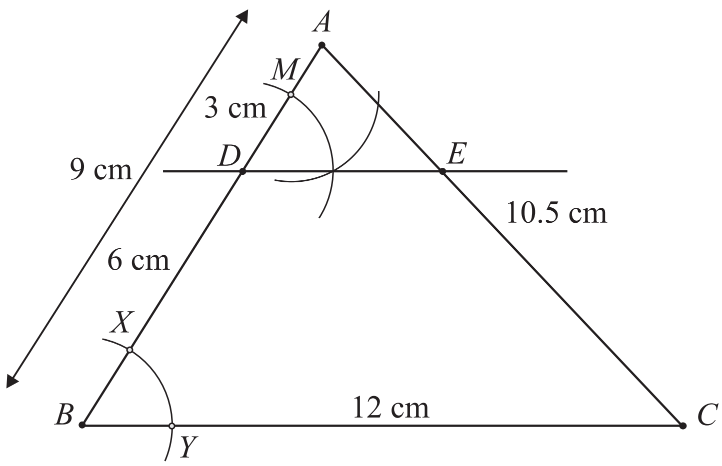
Step 2: Using a compass, draw an arc *XY* with *B* as centre.
Without changing the radius of the compass, draw another arc with *D* as centre.



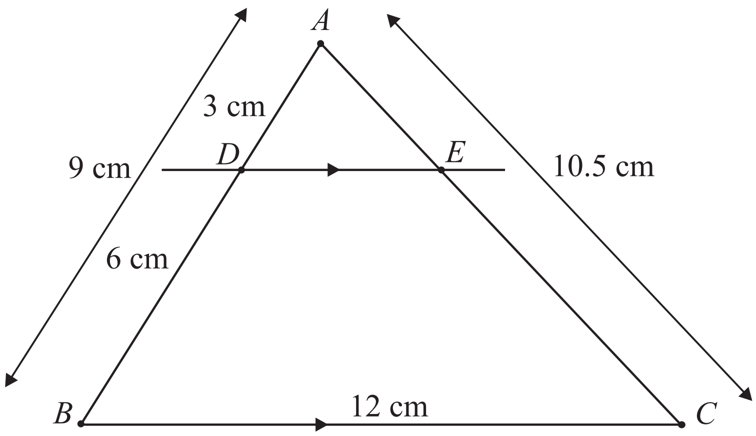
Step 3: Place the point of the compass on *X* and stretch it to *Y*, so that it has a radius of length |*XY*|. Without changing the radius of the compass, draw an arc with centre *M*.



Step 4: Draw a line through *D* and through the intersection of the arcs.
The line *DE* is parallel to *BC*.



> **Theorem 12**. Let ΔABC be a triangle. If a line l is parallel to BC and cuts $[AB]$ in the ratio s:t, then it also cuts $[AC]$ in the same ratio.



$$\frac{|AB|}{|AD|}=\frac{|AC|}{|AE|}\Rightarrow\frac{9}{3}=\frac{10.5}{|AE|}$$

$$\therefore |AE|=\frac{3\times 10.5}{9}=3.5 \text{ cm}$$

$$|AE|+|EC|=10.5$$

$$\therefore |EC|=10.5-3.5=7 \text{ cm}$$

Question 6 (c)

> **Theorem 13**. If two triangles ΔABC and $\Delta A'B'C'$ are similar, then their sides are proportional, in order:
> $$\frac{|AB|}{|A'B'|}=\frac{|BC|}{|B'C'|}=\frac{|CA|}{|C'A'|}.$$

Triangles ADE and ABC are equiangular because:

$|\angle DAE|=|\angle BAC|$ [Common angle]

$|\angle ADE|=|\angle ABC|$ [Corresponding angles]

$|\angle AED|=|\angle ACB|$ [Corresponding angles]

$$\therefore \frac{|AD|}{|AB|}=\frac{|DE|}{|BC|}\Rightarrow\frac{3}{9}=\frac{|DE|}{12}$$

$$|DE|=\frac{3\times 12}{9}=4 \text{ cm}$$