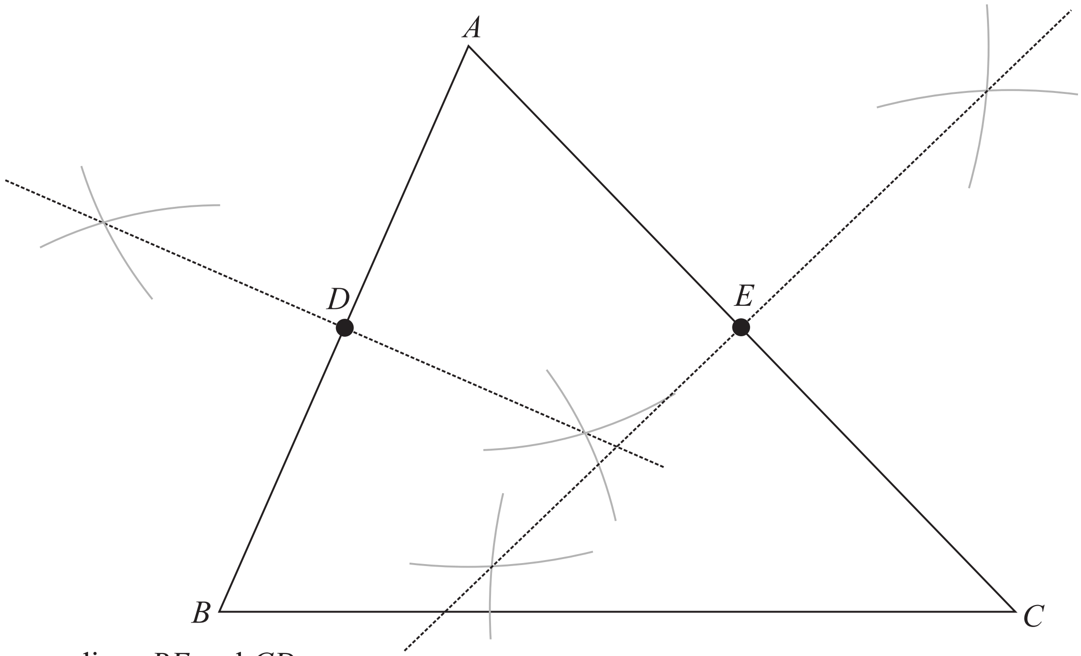
LC 2015: Paper 2

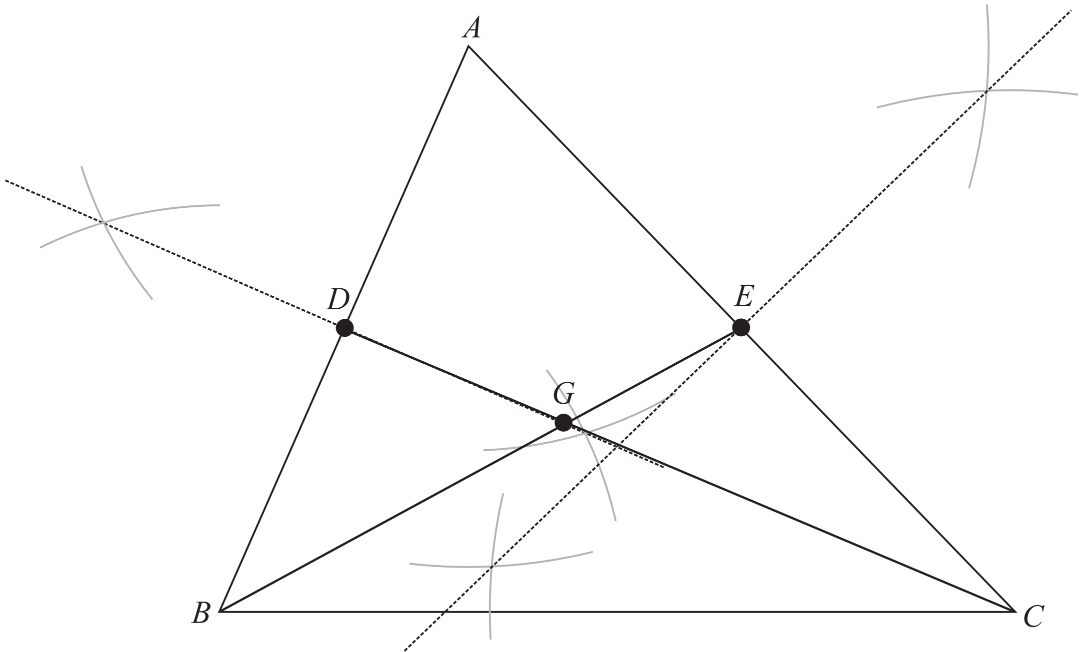
Question 6 (25 marks)

Question 6 (a)

The centroid of a triangle is the intersection of the medians.
A median is a line from a vertex to the midpoint of the opposite side.
Using a compass, bisect lines AB and AC to get the midpoints D and E of these lines.



Draw medians BE and CD.
The centroid G is the intersection of these medians.



Marking Scheme Notes

Question 6 (a) [Scale 5C (0, 2, 4, 5)]

2: • Some relevant calculation
• One side bisected
• One midpoint indicated

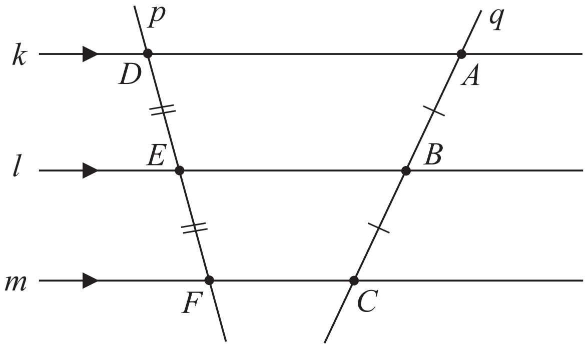
4: • One median drawn

Question 6 (b)

The transversal line theorem
If three parallel lines cut off equal segments on some transversal line, then they will cut off equal intercepts on any other transversal.

Given: $k \parallel l \parallel m$ and $|DE| = |EF|$.

Prove: $|AB| = |BC|$



Construction: Draw a line $D'F'$ through B parallel to DF.

Proof:

$DEBD'$ is a parallelogram $\Rightarrow |DE| = |D'B|$

$EFF'B$ is a parallelogram $\Rightarrow |EF| = |BF'|$

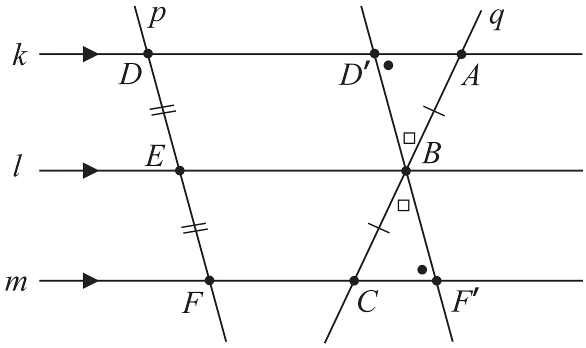
$\therefore\ |D'B| = |BF'|$ (because $|DE| = |EF|$)

$|\angle AD'B| = |\angle BF'C|$ (alternate angles)

$|\angle ABD'| = |\angle CBF'|$ (vertically opposite)

$\therefore\ |\Delta AD'B| = |\Delta BCF'|$

$\therefore\ |AB| = |BC|$



Marking Scheme Notes
Question 6 (b)
Diagram/Given: [Scale 5B (0, 2, 5)]
2: • Effort at *Diagram* or *Given*

Construction: [Scale 5B (0, 2, 5)]
2: • Construction attempted (diagram and/or description)

Proof: [Scale 10C (0, 4, 8, 10)]
4: • More than one critical step omitted but still some substantial work of merit
8: • Proof completed with one critical step omitted