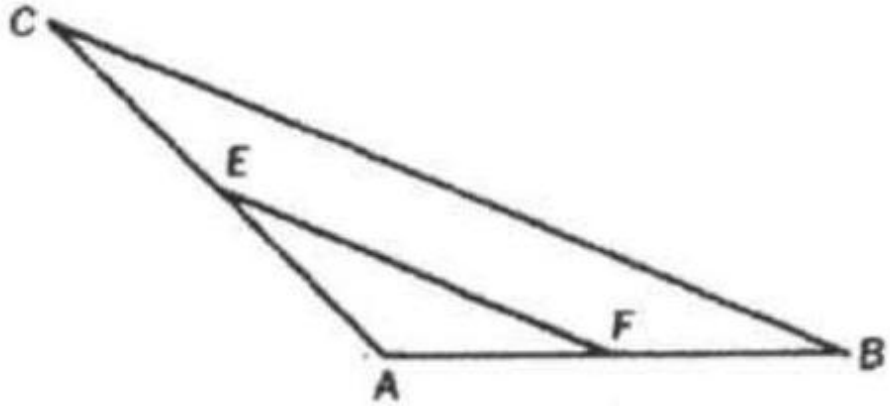
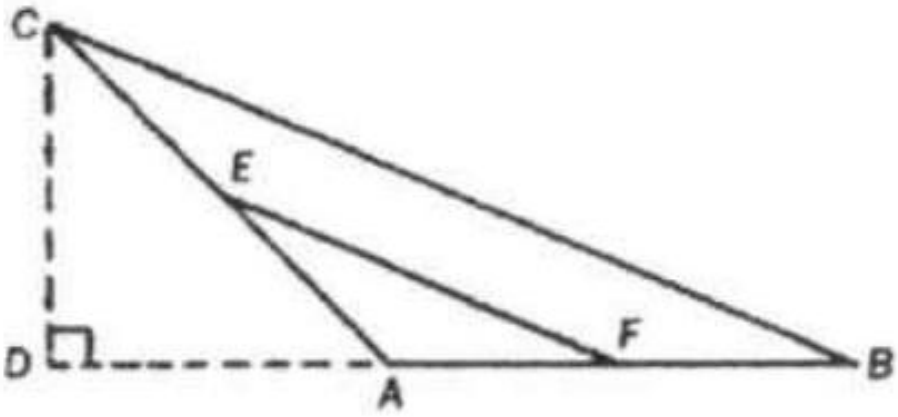
Example 6

If the measures of two sides and the included angle of a triangle are $7, \sqrt{50}$, and $135°$, respectively, find the measure of the segment joining the midpoints of the two given sides.



Solution: $\frac{13}{2}$.
Draw altitude CD. Since $\angle CAB = 135, \angle DAC = 45$, therefore, $\triangle ADC$ is an isosceles right triangle. If $AC = \sqrt{50} = 5\sqrt{2}$, then $DA = DC = 5$.
In $\triangle DBC$, since $DB = 12$ and $DC = 5, BC = 13$.



Therefore, $EF = \frac{1}{2}BC = \frac{13}{2}$.