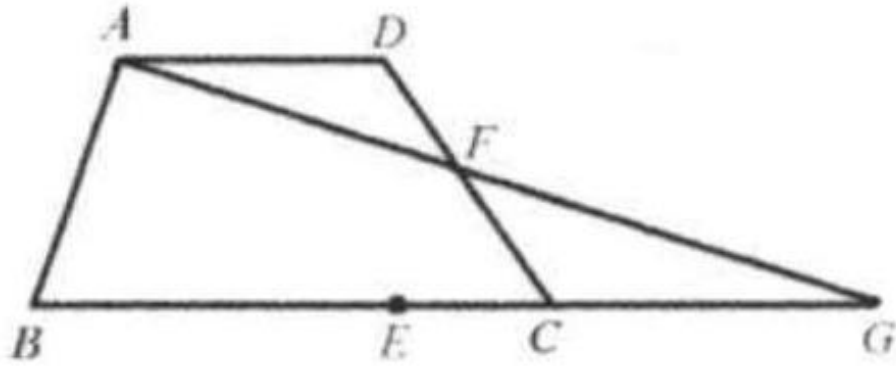


Problem 7

Problem

$ABCD$ is a quadrilateral with $AD \parallel BC$. Draw $AG \perp AB$ to meet DC at F and the extension of BC at G . Point E is the midpoint of sides BG . Find the length AE if $AD = 2.7$, $AF = 4$, and $AB = 6$.

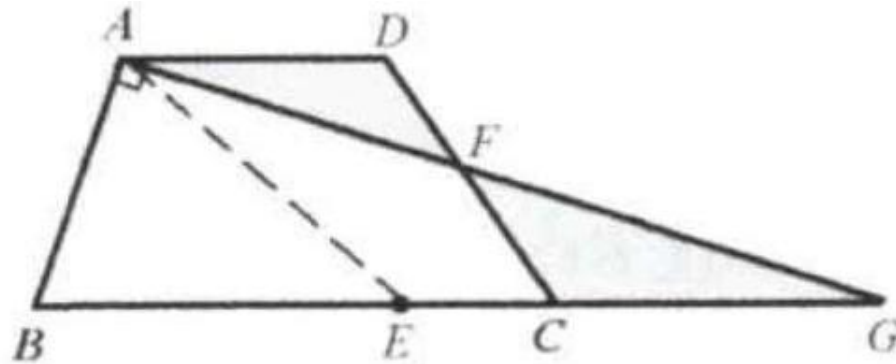


Solution

5.

Draw AE . Since AE is the median, by Theorem 1.3, $AE = BE = EG$.

Since $AD \parallel BC$, $\angle DAF = \angle CGF$.



$$\angle DFA = \angle CFG \text{ (vertical angles).}$$

$$\angle ADF = \angle GCF.$$

$$\text{Thus } \triangle ADF \cong \triangle GCF. AF = FG = 4.$$

Triangle ABG is a $6 - 8 - 10$ right triangle. $BE = \frac{1}{2}BG = 5$.

The answer is $AE = BE = 5$.