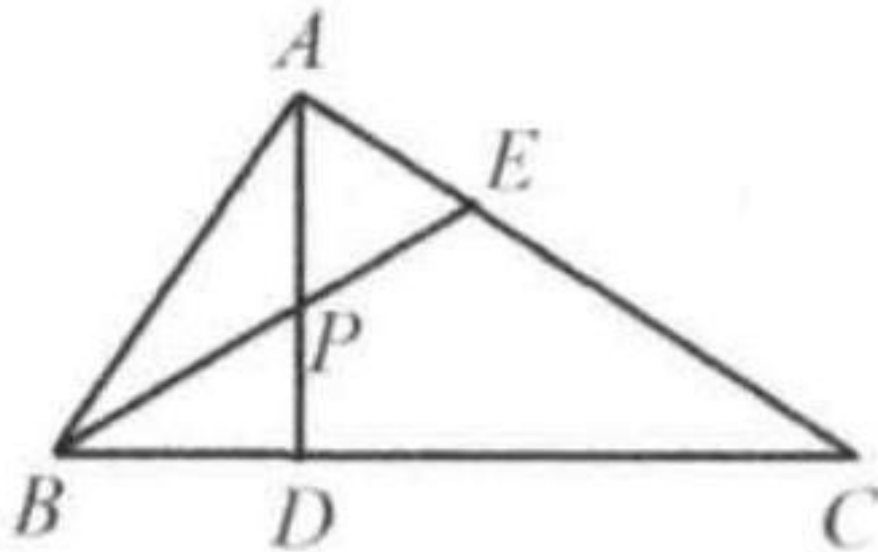


Example 8

In right $\triangle ABC$, AD is the height and P is the midpoint of AD . Connect BP and extend it to meet AC at E . Suppose that $AC : AB = k$, what is the value of AE/EC ?

- (A) $\frac{1}{1+k^2}$
- (B) $\frac{1}{1+k}$
- (C) $\frac{2}{1+k^2}$
- (D) $1+k$
- (E) $\frac{2}{1+k}$

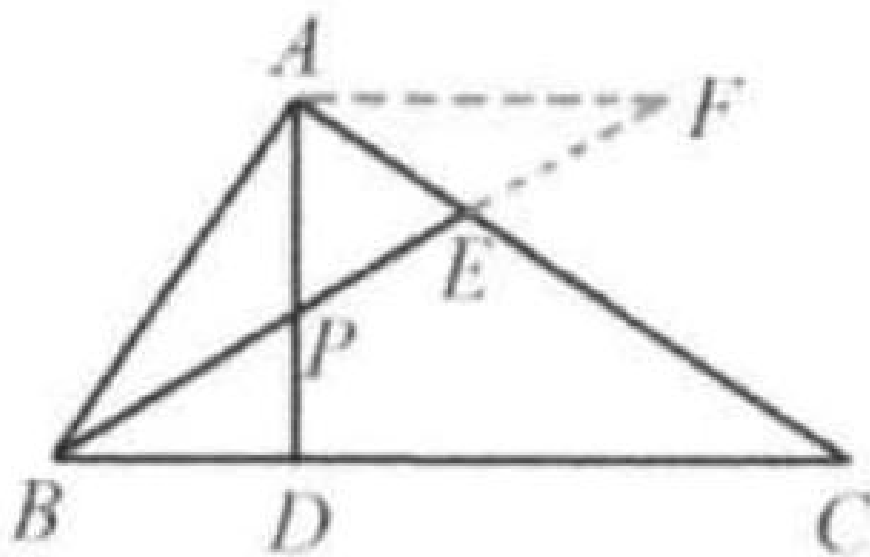


Solution: (A).

Draw $AF \parallel BC$ and AF meets the extension of BE at F . $\triangle AFE$ is similar to $\triangle CBE$, we have $\frac{AE}{EC} = \frac{AF}{BC}$. We know that $AP = PD$, so

$$AF = BD, \text{ so } \frac{AE}{EC} = \frac{BD}{BC}.$$

$$\text{By (12.3) and (12.4), } \frac{BD}{DC} = \frac{AB^2}{AC^2} = \frac{1}{k^2}.$$



Thus $\frac{BD}{BC} = \frac{BD}{BD+DC} = \frac{1}{1+k^2}$.
 Therefore $\frac{AE}{EC} = \frac{1}{1+k^2}$.