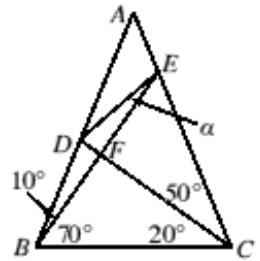22. In the diagram, $\angle ABE = 10°$; $\angle EBC = 70°$; $\angle ACD = 50°$; $\angle DCB = 20°$; $\angle DEF = \alpha$.

Which of the following is equal to $\tan \alpha$?

A $\dfrac{\tan 10° \tan 20°}{\tan 50°}$

B $\dfrac{\tan 10° \tan 20°}{\tan 70°}$

C $\dfrac{\tan 10° \tan 50°}{\tan 70°}$

D $\dfrac{\tan 20° \tan 50°}{\tan 70°}$

E $\dfrac{\tan 10° \tan 70°}{\tan 50°}$

22. **A** As the sum of the angles in a triangle is $180°$, in triangle CBF, $\angle BFC = 90°$. As vertically opposite angles are equal $\angle DFE = \angle BFC = 90°$. As the sum of the angles on a straight line is $180°$, $\angle DFB = \angle EFC = 90°$. Hence in triangle EFD, $\tan \alpha = \frac{DF}{EF}$: in triangle DFB, $\tan 10° = \frac{DF}{FB}$: in triangle BFC, $\tan 20° = \frac{FB}{FC}$ and in triangle CEF, $\tan 50° = \frac{EF}{FC}$. Thus
$\tan \alpha = \frac{DF}{EF} = \frac{\tan 10° FB}{EF} = \frac{\tan 10° \tan 20° FC}{EF} = \frac{\tan 10° \tan 20°}{\tan 50°}$.