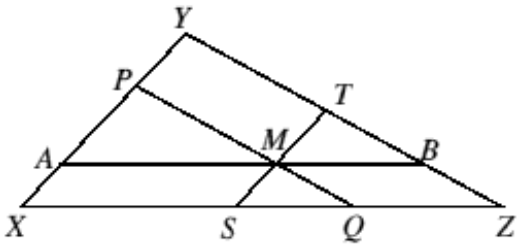
21. The diagram shows a triangle XYZ. The sides XY, YZ and XZ have lengths 2, 3 and 4 respectively. The lines AMB, PMQ and SMT are drawn parallel to the sides of triangle XYZ so that AP, QS and BT are of equal length. What is the length of AP?



A $\frac{10}{11}$ B $\frac{11}{12}$ C $\frac{12}{13}$ D $\frac{13}{14}$ E $\frac{14}{15}$

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21. **C** All of the triangles in the diagram are similar as they contain the same angles. The sides of each triangle are therefore in the ratio 2 : 3 : 4. First consider triangle APM. Let $AP = x$, so that $AM = 2x$. Now considering triangle TBM, as $BT = x$, $BM = \frac{4x}{3}$. The quadrilateral $AMSX$ is a parallelogram as AM is parallel to XS and MS is parallel to AX. So $AM = XS = 2x$. Similarly $QZ = BM = \frac{4x}{3}$. Considering the base of triangle XYZ, $XS + SQ + QZ = 4$. So $2x + x + \frac{4x}{3} = 4$ and therefore $x = \frac{12}{13}$.