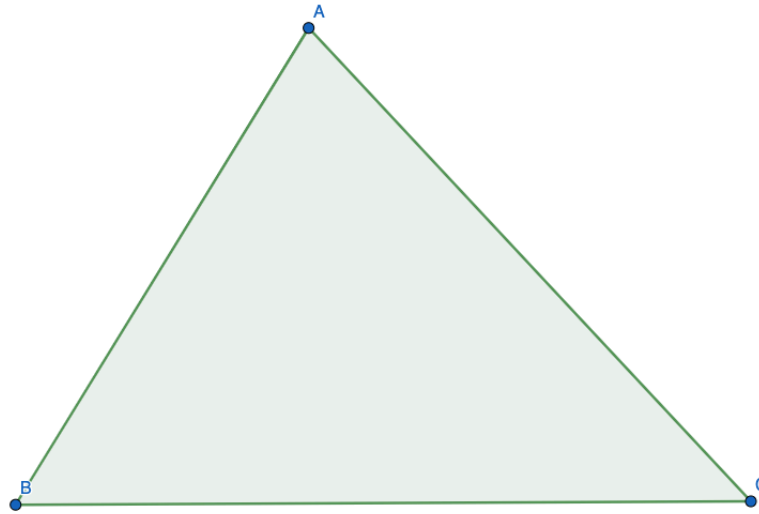
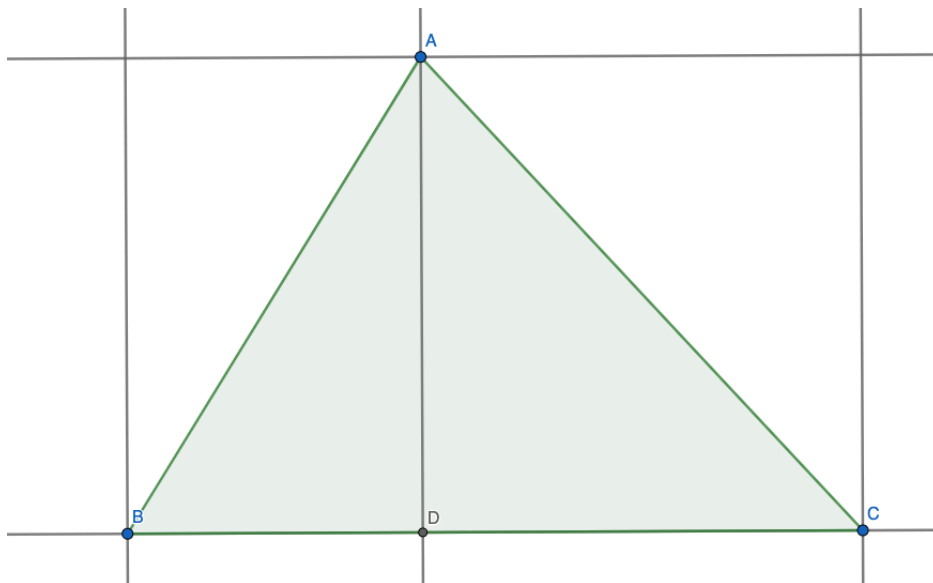


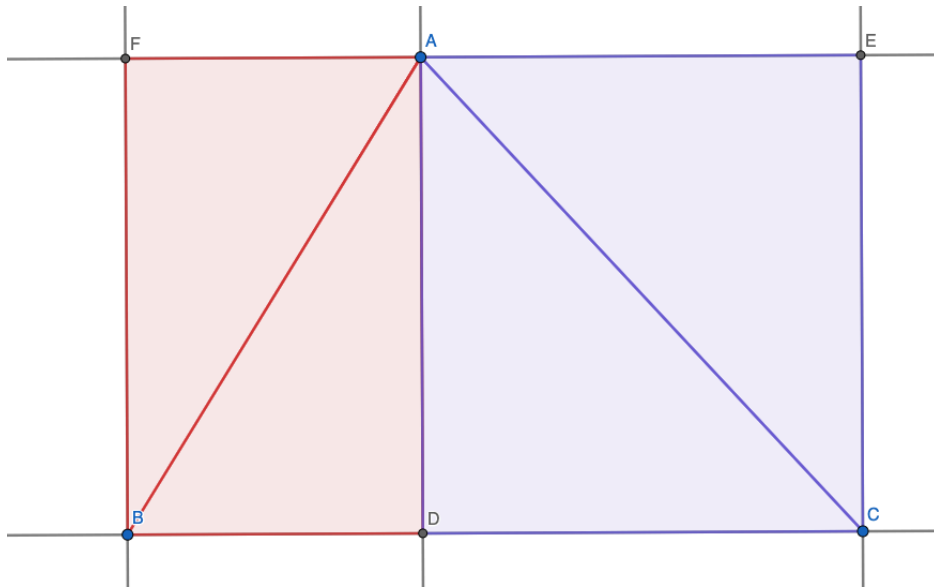
Shear Magic - Mahdi Raza



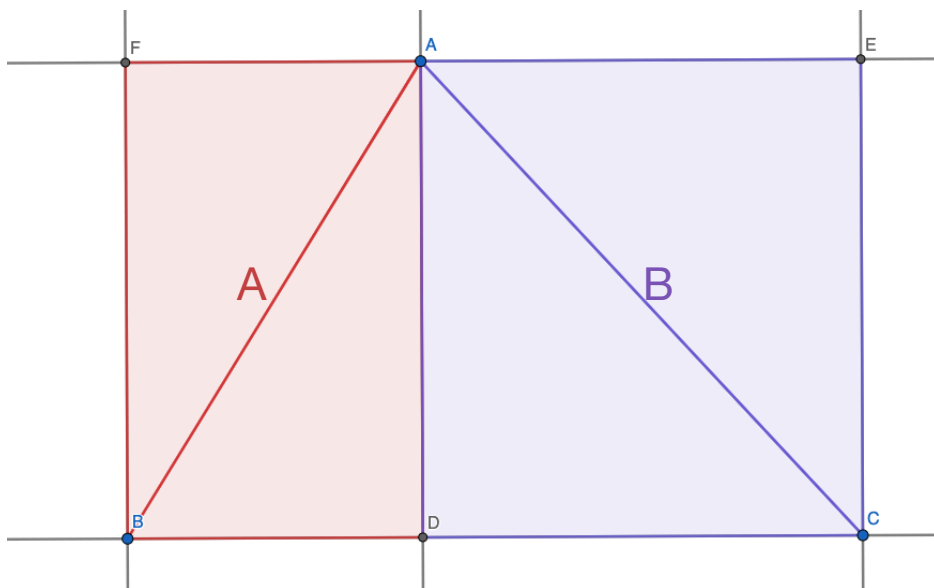
Take an arbitrary triangle, say $\triangle ABC$.



- Drop a perpendicular from A to BC and let it intersect on point D.
- Create a line perpendicular to BC passing through A.
- Let perpendiculars from B and C intersect on this parallel line at E and F respectively.



Since lines are perpendicular, we have 2 rectangles, $ADBF$ and $ADCE$



Let areas of $ADBF$ and $ADCE$ be A and B respectively

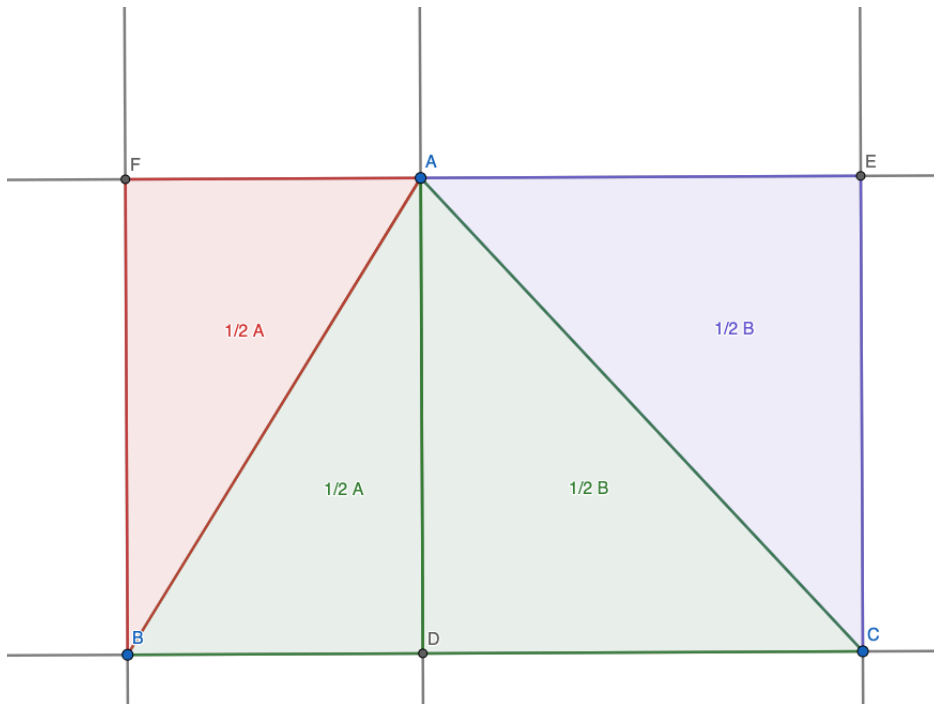
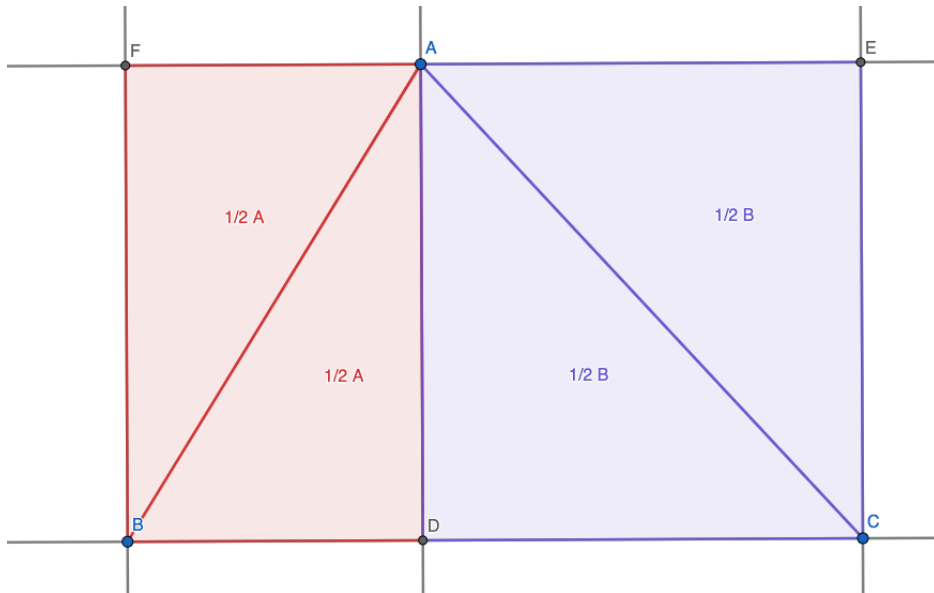
This implies that area of rectangle $BCFE$ is equal to $A + B$

If we let base $BC = b$ and $AD = h$, then

$$[BCFE] = bh$$

$$[BCFE] = A + B$$

$$\implies A + B = bh$$



Area of triangle ABC is

$$\begin{aligned}
 [ABC] &= \frac{1}{2}A + \frac{1}{2}B \\
 &= \frac{1}{2}(A + B) \\
 &= \frac{1}{2}(bh) \quad [A + B = bh]
 \end{aligned}$$