Kite in a Square 1

Rearrange the cards to explain how to find what fraction of the total area is shaded.

The shaded area is made up of two congruent triangles, one of which has vertices $(\frac{1}{3}, \frac{2}{3}), (\frac{1}{2}, \frac{1}{2}), (\frac{1}{2}, 1)$.	A
The line joining $(0,0)$ to $(\frac{1}{2}, 1)$ has equation $y = 2x$	B
Area of the triangle $= \frac{1}{2}(\frac{1}{2} \times \frac{1}{6}) = \frac{1}{24}$	C
The line joining $(0,1)$ to $(1,0)$ has equation $y = 1 - x$.	D
Therefore the shaded area is $2 \times \frac{1}{24} = \frac{1}{12}$	E
The point (a,b) is at the intersection of the lines $y = 2x$ and $y = 1 - x$.	F
Consider a unit square drawn on a coordinate grid.	G
The perpendicular height of the triangle is $\frac{1}{2} - \frac{1}{3} = \frac{1}{6}$.	H
So $a = \frac{1}{3}, b = \frac{2}{3}$.	I
The line joining $(0,0)$ to $(1,1)$ has equation $y = x$.	J