Kite in a Square 3

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

The area of $\Delta DMC = 2$ sq units. The area of $\Delta DFC = 1$ sq unit.	A
ΔEHF is right-angled so we have $(EH)^2 + (HF)^2 = (EF)^2$	B
The areas of ΔDFE, ΔCFG and the shaded area $MEFG$ are equal, and the total area of them is 1, so each must have an area of $\frac{1}{3}$ sq units.	C
Area of $\Delta MEF = \frac{1}{2}(1 \times EH) = \frac{1}{2}\left(\frac{EF}{\sqrt{2}}\right)$	D
By Pythagoras, DF has length $\sqrt{2}$.	E
The total area of the square is 4 sq units, so the shaded area is $\frac{1}{12}$ the area of the whole square.	F
Area of $\Delta DFE = \frac{DF \times EF}{2} = \frac{\sqrt{2} \times EF}{2} = \frac{EF}{\sqrt{2}}$ sq units	G
So the shaded area $MEFG$ is equal to the area of ΔDFE	H
Assume that the sides of the square are each 2 units long. Thus, DJ and FJ are each 1 unit long.	I
The area of the arrowhead $MDFC$ is equal to the difference between the areas of ΔDMC and ΔDFC; therefore this area is 1 sq unit.	J
By symmetry, area of ΔCFG is the same as the area of ΔDFE	K
$EH = HF \Rightarrow 2(EH)^2 = (EF)^2$ therefore $EH = \frac{EF}{\sqrt{2}}$	L
Area of $MEFG$ is twice the area of ΔMEF, therefore area $MEFG = \frac{EF}{\sqrt{2}}$	M