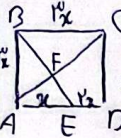


$$\frac{AE}{BC} = \frac{x}{12} = \frac{1}{3} \Rightarrow \frac{AF}{AC} = \frac{1}{3} \Rightarrow AC = 3\sqrt{2} \Rightarrow \frac{AF}{3\sqrt{2}} = \frac{1}{3} \Rightarrow AF = \frac{3\sqrt{2}}{3}$$

$$\frac{EF}{EB} = \frac{1}{3} = \frac{EF}{2\sqrt{2}} \Rightarrow EF = \frac{2\sqrt{2}}{3}$$

$$\frac{EF}{AF} = \frac{\frac{2\sqrt{2}}{3}}{\frac{3\sqrt{2}}{3}} = \frac{\sqrt{2}}{3\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}} = \frac{1\sqrt{2}}{9} = \frac{\sqrt{2}}{9}$$



$$BE^2 = 12^2 + 12^2 \Rightarrow BE = 12\sqrt{2}$$

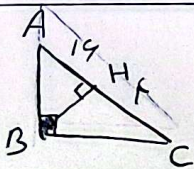
$$\hat{E} = \hat{C}, \hat{A} = \hat{A} \Rightarrow EAD \sim BAC \Rightarrow \frac{AD}{AB} = \frac{AE}{AC} \Rightarrow \frac{2}{2+1} = \frac{x}{12}$$

$$\Rightarrow 2 + x = 3 \xrightarrow{\Delta=121} x = \frac{-1 \pm 11}{2} \Rightarrow x = 5$$

$$DEH \sim FHC \Rightarrow \frac{EH}{FH} = \frac{DE}{FC} \Rightarrow \frac{x}{y} = \frac{a}{FC} \Rightarrow \frac{a}{x} = \frac{a}{FC} \Rightarrow FC = \frac{a}{3}$$

$$DAE \sim BAB \Rightarrow \frac{DE}{BC} = \frac{AE}{AC} \Rightarrow \frac{a}{12 + \frac{a}{3}} = \frac{x}{x+1+2} \Rightarrow \frac{a}{12 + \frac{a}{3}} = \frac{1}{3} \Rightarrow 3 + \frac{a}{3} = 12 \Rightarrow a = 9 \Rightarrow \frac{a}{3} = 3$$

$$\Rightarrow BC = 12 + \frac{a}{3} = 12 + \frac{9}{3} = 15$$

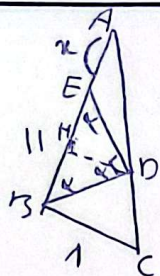


$$\left. \begin{aligned} AB^2 &= AH \times AC = 14 \times 15 = 210 \Rightarrow AB = \sqrt{210} \\ BC^2 &= CH \times AC = 1 \times 15 = 15 \Rightarrow BC = \sqrt{15} \end{aligned} \right\} \Rightarrow \frac{AB}{BC} = \frac{\sqrt{210}}{\sqrt{15}} = \frac{\sqrt{14}}{1} = \sqrt{14}$$

$$AFB \sim EFC \Rightarrow \frac{AF}{FC} = \frac{BF}{FE} \Rightarrow \frac{AF}{1} = \frac{4}{EF} \Rightarrow \frac{1+EF}{1} = \frac{4}{EF} \Rightarrow x^2 + 1x - 4 = 0$$

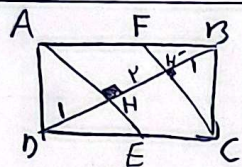
$$\Delta = 17 \Rightarrow x = \frac{-1 \pm \sqrt{17}}{2} \Rightarrow x = \frac{-1 + \sqrt{17}}{2}$$

$$\Rightarrow EF = 4 \Rightarrow AF = AE + EF = 1 + 4 = 5$$



$$\Rightarrow EH = BH = DH = \frac{11}{\sqrt{2}} = d, d$$

$$AHD \sim ABC \Rightarrow \frac{AH}{AB} = \frac{DH}{BC} \Rightarrow \frac{d/d+x}{11+x} = \frac{d/d}{1} \Rightarrow \boxed{2 = 4/4}$$



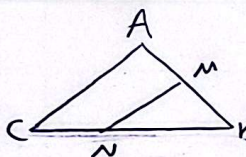
$$AH^2 = 1 \times 1 \Rightarrow AH = \sqrt{1}$$

$$AH^2 = (\sqrt{1})^2 + 1^2 = 2 \Rightarrow AD = \sqrt{2}$$

$$F^2 = 1^2 + AB^2 \Rightarrow AB = \sqrt{2}$$

$$DHE \sim AHB \Rightarrow \frac{AH}{HE} = \frac{AB}{DE} = \frac{BH}{DH} \Rightarrow \frac{\sqrt{2}}{HE} = \frac{\sqrt{2}}{DE} = \frac{1}{1} \Rightarrow EH = \frac{\sqrt{2}}{1}$$

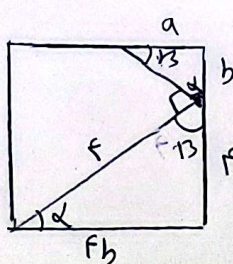
$$S_{\text{مربع}} = \frac{2\sqrt{2} \times 2}{2} = \frac{2\sqrt{2}}{1} = \frac{2\sqrt{2}}{1} = \boxed{2\sqrt{2}}$$



$$\frac{AC}{MN} = \frac{AB}{MB} = \frac{CB}{NB} = \frac{d}{1} \Rightarrow \frac{AB}{AC} = \frac{NB}{MN}$$

$$S_{ABC} = 1 S_{BMN} \Rightarrow \frac{1}{2} \times AB \times BC \times \sin B = 1 \times MB \times NB \times \sin B \times \frac{1}{2}$$

$$\Rightarrow AB \times \frac{d}{1} \times BN = BN \times MB \times 1 \Rightarrow \boxed{\frac{MB}{AB} = \frac{d}{9}}$$



$$a^2 + b^2 = 1 \Rightarrow b^2 = \frac{14}{10}$$

$$f_a + b = f_b \Rightarrow f_a = 3b \Rightarrow a = \frac{3}{4}b$$

$$8 = 14 \times \frac{14}{10} = 1.96$$

$$\left. \begin{array}{l} AG = 1 GM = \frac{1}{3} AM \\ GM = \frac{1}{3} AG = \frac{1}{3} AM \end{array} \right\} \Rightarrow GN = \frac{1}{3} BD$$

$$FD = \frac{1}{3} GN \xrightarrow{60^\circ = 180^\circ} FD = \frac{1}{3} \times \frac{1}{3} \times BD \Rightarrow 9 FD = BD \Rightarrow \frac{BD}{FD} = 9$$