

$\triangle AEF \sim \triangle FBC$ زیرا $\begin{cases} \angle F_1 = \angle F_2 \\ \angle C_2 = \angle A_1 \end{cases}$ $\rightarrow ED = 2AE$

$\rightarrow \frac{AE}{BC} = \frac{FE}{BF} = \frac{AF}{CF} = \frac{1}{3}$ $\left[\begin{array}{l} \text{مقدار نسبت برابر} \\ \text{مقدار مربع} \end{array} \right]$ $AF = \frac{3\sqrt{2}}{4}$ $\frac{3}{\sqrt{18}} = \frac{AC}{BE}$ $\frac{\sqrt{10}}{4} = \frac{BE}{\frac{3\sqrt{2}}{4}}$

(۲)
۱
 $\frac{\sqrt{5}}{3}$ ✓

$\triangle EID \sim \triangle ABC$ زیرا $\begin{cases} \angle A = \angle A \\ \angle D = \angle B \end{cases} \rightarrow \frac{AD}{AB} = \frac{AE}{AC}$ $\frac{2}{x+1} = \frac{x}{15}$

(۲)
۲
عقبات

$\frac{2}{x+1} = \frac{x}{15} \rightarrow x^2 + x - 30 = 0 \rightarrow x = -5, 6$

$3x - 5x = 2 \cdot \frac{5}{3}x$ $\triangle EDH \sim \triangle HFC$ زیرا $\begin{cases} \angle H_1 = \angle H_2 \\ \angle E = \angle F \end{cases}$ $\rightarrow \frac{x}{2} = \frac{ED}{CF} = \frac{3}{5}$ $\rightarrow \frac{x}{2} = \frac{3}{5} \rightarrow x = \frac{6}{5}$

(۲)
۳
 $\frac{27}{4}$ ✓

$\rightarrow z = \frac{3}{4} \rightarrow BC = 3 + \frac{15}{4} = \frac{27}{4}$

$\triangle ABH \sim \triangle AHC$ زیرا $\begin{cases} \angle H_1 = \angle H_2 \\ \angle A_1 = \angle A_2 \end{cases}$ $\rightarrow \frac{AB}{AC} = \frac{BH}{AH} = \frac{AH}{HC}$

$\rightarrow \frac{4}{AH} = \frac{AH}{16} \rightarrow AH = 8 \rightarrow \frac{AB}{AC} = \frac{8}{16} = \frac{1}{2}$

(۲)
۴

$\triangle BAF \sim \triangle ECF$ زیرا $\begin{cases} \angle F_1 = \angle F_2 = 90^\circ \\ \angle A_1 = \angle C_1 \end{cases}$ $\rightarrow \frac{BF}{EF} = \frac{AF}{CF}$ $\rightarrow \frac{6}{x} = \frac{8+x}{8}$

$\rightarrow x(x+8) = 48 \rightarrow x = 4 \rightarrow AF = 4 + 8 = 12$

(۲)
۵

$HD \parallel BC, HD \perp AB \rightarrow \angle B_1 H = 20^\circ, \angle B_2 H = 45^\circ$

$\angle D_1, \angle D_2 = 45^\circ \rightarrow \angle F = 45^\circ \rightarrow BH, HE = 5/5$
 $\rightarrow DH^2 = BH \cdot HE \rightarrow DH = 5/5$
 $\rightarrow x = \frac{16/5}{2/5} = 8$ ✓

$S_{ABD} + S_{CBD} = S_{ABCD}$
 $2 \left(\frac{H \cdot 4x}{2} \right) = 4xH$
 $\frac{4xH}{\frac{xH}{2}} = 8$ ✓

$2BN = 3NC$
 $\frac{S_{MBN}}{S_{ABC}} = \frac{\frac{1}{2} \sin B \cdot BM \cdot NB}{\frac{1}{2} \sin B \cdot AB \cdot BC}$
 $\rightarrow \frac{3BM}{5AB} = \frac{1}{3} \rightarrow \frac{BM}{AB} = \frac{5}{9} \rightarrow \frac{BM}{AM} = \frac{5}{4}$ ✓

$AE \parallel PC \rightarrow \triangle AEP \sim \triangle PDC$
 $\frac{1}{4} = \frac{F}{x} \rightarrow x^2 + (x-F)^2 = 16$
 $\rightarrow \frac{25}{16} x^2 = 16 \rightarrow x = \frac{256}{25}$ ✓

$\theta \rightarrow$ ميل منحنى $\frac{y}{x}$ $\rightarrow GD = \frac{1}{3} BD, AGC, GD, AE$
 $F =$ ميل $\rightarrow FD = \frac{1}{3} GD \rightarrow \frac{BD}{FD} = 9$ ✓