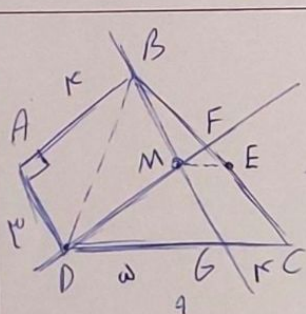


$$\frac{S_{BCE}}{S_{BDE}} = \frac{BC}{DE} = \frac{AB}{AD} = \frac{12}{5} \quad \left[\frac{12}{5} = 2,4 \right]$$

۵)

۱



$$\triangle BDM \sim \triangle MDG \rightarrow DG = BD = 5 \quad [GC = F]$$

$$\rightarrow BE = CE, BM = MG$$

۱)

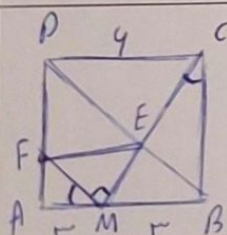
۲



$$\triangle ABC \sim \triangle DEF \quad \frac{DE}{AB} = \frac{EF}{AC} \quad AB = \frac{12 \times 3}{2,5} = \frac{36}{2,5} = 14,4$$

۵)

۳



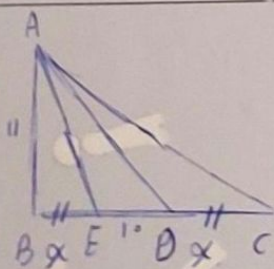
$$MC = \sqrt{4^2 + 3^2} = \sqrt{16 + 9} = 5$$

$$MF = \sqrt{\left(\frac{3}{2}\right)^2 + 3^2} = \frac{3}{2} \sqrt{5}$$

$$S_{MEF} = \frac{1}{2} \left(\frac{3}{2} \sqrt{5} \right) (2\sqrt{5}) = \frac{15}{2}$$

۵)

۴



$$\triangle CAE \sim \triangle AEP \rightarrow \frac{CE}{AE} = \frac{AE}{DE} \quad (AE)^2 = CE \times DE$$

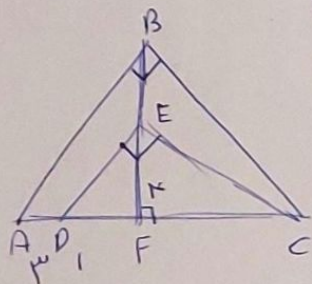
$$AE = \sqrt{x^2 + 11^2} \rightarrow (\sqrt{x^2 + 11^2})^2 = (x + 10) \times 10$$

$$x^2 + 121 = 10x + 100 \quad x^2 - 10x + 21 = 0 \quad (x - 7)(x - 3) = 0$$

$$\boxed{x = 3}$$

۵)

۵



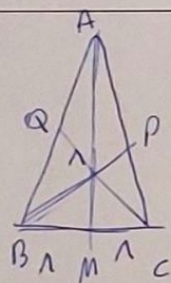
$$FE^r = DF \times FC \quad F^r = 1 \times FC \quad FC = 14$$

$$EC^r = FC \times DC \quad EC^r = 14 \times 14 \quad EC = \sqrt{14 \times 14} = 14$$

$$\triangle ABC \sim \triangle DEC \quad \frac{BC}{EC} = \frac{AC}{DC} \quad \frac{BC}{14} = \frac{20}{14} \quad BC = \frac{10 \times \sqrt{14}}{14}$$

1

6



$$AM = \frac{14}{r} = 1$$

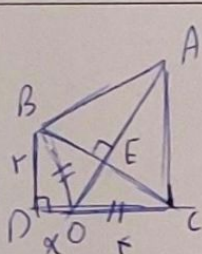
$$AC = AB = \sqrt{1^r + 1^r} = 1\sqrt{2}$$

$$CQ = AQ^r + AC^r \quad (1\sqrt{2})^r + (1\sqrt{2})^r = 140 = 1\sqrt{10}$$

$$CQ = BP = \boxed{1\sqrt{10}}$$

5

7

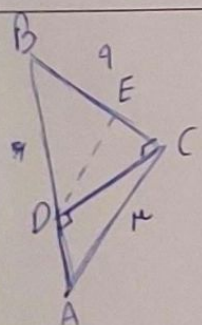


$$BO^r = BD^r + DO^r \quad BO^r = x^r + r^r$$

$$BO = OC \quad BO^r = CO^r \quad x^r + r^r = 14 \quad x^r = 1r \quad x = \sqrt{1r}$$

0

1



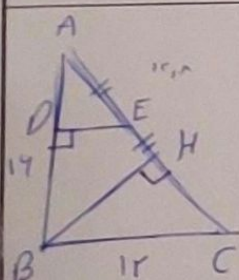
$$AB = \sqrt{r^r + 9^r} = \sqrt{40} = 2\sqrt{10}$$

$$BC^r = BD \times BA \quad (9)^r = BD \times 2\sqrt{10} \quad BD = \frac{2\sqrt{10}}{\sqrt{10}}$$

$$BD^r = BE \times BC \quad \left(\frac{2\sqrt{10}}{\sqrt{10}}\right)^r = BE \times 9 \quad BE = \frac{\frac{2\sqrt{10}}{\sqrt{10}} \times 9}{9} = \frac{2\sqrt{10}}{9} = \boxed{1,1}$$

5

9



$$AC = \sqrt{(14)^r + (1r)^r} = 20$$

$$AB^r = AH \times AC \quad 14^r = AH \times 20 \quad AH = \frac{14 \times 4}{20} = 12, 1$$

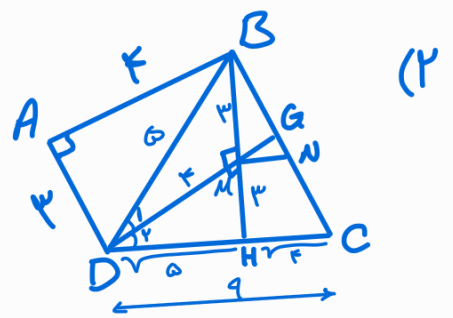
$$AE = HE = \frac{12, 1}{2} = 6, 1$$

$$\frac{AE}{AC} = \frac{DE}{BC} \quad \frac{6, 1}{20} = \frac{DE}{12} \quad \boxed{DE = 3, 12}$$

5

10

$\angle DMH \leftarrow \hat{D}_1 = \hat{D}_2$ ، BDM هم‌انشت هستند
 در مثلث BMC ، BMN با نسبت ۲ و متشابه اند پس $MC = \frac{1}{2} AC$ است
 بنابراین فاصله M از وسط ضلع BC برابر ۲ است



$$EF^2 = DF \times FC \rightarrow FC = 14 \quad BC^2 = FC \times AC \rightarrow BC = 1\sqrt{5} \quad (4)$$

$$2\alpha + \beta = 90^\circ \quad BD^2 + DC^2 = BC^2 \rightarrow BC = 2\sqrt{5} = 2BE = 2EC$$

$$\rightarrow BE = EC = \sqrt{5}$$

$$\frac{2}{\sqrt{5}} = \frac{F}{AE} = \frac{2\sqrt{5}}{5} \rightarrow AE = 2\sqrt{5}$$

$$S_{ABE} = \frac{1}{2} AE \times BE = 5$$

