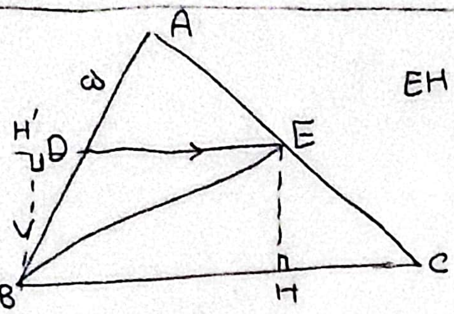
مرتضی آقایی — ۲۰ — تکلیف شماره‌ی ۲۲ — یازدهم دفتر C

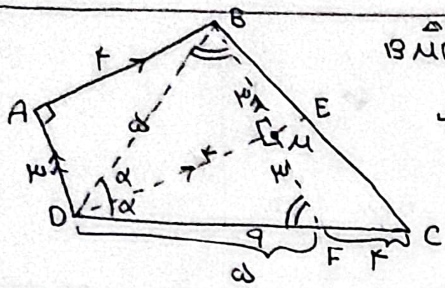
.1



$EH = BH' \rightarrow \frac{S_{BCE}}{S_{BDE}} = \frac{EH \times BC \times \frac{1}{2}}{\frac{1}{2} \times DE \times BH'} = \frac{۱۲}{۵} = ۲/۴$

$\frac{DE}{BC} = \frac{AD}{AB} = \frac{۵}{۱۲}$

(۲)



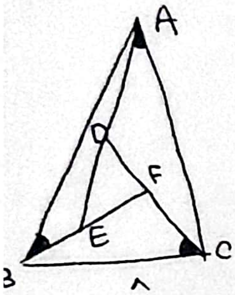
۵. طبق خواص نیمساز و میانه قطعاً M تا وسط BC

$\hat{BMO} \cong \hat{MOF} \rightarrow BM = MF = ۳$

می‌شود $۵ \longleftarrow ۲ = \frac{DM}{۲} = ME \Leftarrow$ چون MD نیمساز، میانه و ارتفاع و عمود منصف هم هست

(۲)

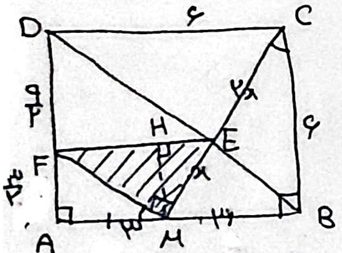
.3



$\overset{\triangle}{ABC} \sim \overset{\triangle}{DEF} \rightarrow \frac{AB}{۳} = \frac{۸}{۲/۵} \rightarrow AB = ۹/۶$

(۲)

.4



$\overset{\triangle}{BCM} \sim \overset{\triangle}{AMF} \rightarrow \frac{BM}{AF} = \frac{CM}{FM} = \frac{CB}{AM}$

$CM = \sqrt{۳۶ + ۹} = ۳\sqrt{۵}$

$AF = \frac{۳}{۲}$

$DF = ۶ - \frac{۳}{۲} = \frac{۹}{۲}$

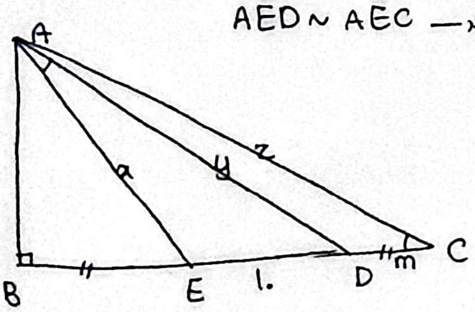
$FM = \sqrt{۹ + \frac{۹}{۴}} = \sqrt{\frac{۴۵}{۴}} = \frac{۳\sqrt{۵}}{۲}$

$DB = ۶\sqrt{۲}$

$\overset{\triangle}{BEM} \sim \overset{\triangle}{CED} \rightarrow \frac{ME}{EC} = \frac{MB}{DC} \rightarrow x + ۲x = ۳\sqrt{۵} \rightarrow ۳x = ۳\sqrt{۵} \rightarrow x = \sqrt{۵} \rightarrow S_{\hat{MEF}} = \frac{1}{2} \times \frac{۳\sqrt{۵}}{۲} \times \sqrt{۵} = \frac{۱۵}{۴}$

(۲)

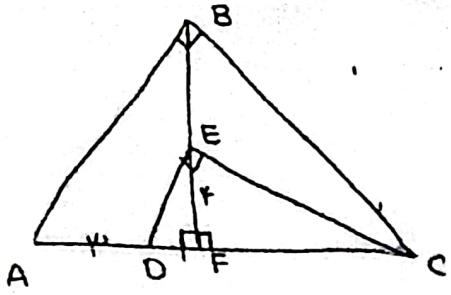
.5



$\overset{\triangle}{AED} \sim \overset{\triangle}{AEC} \rightarrow \frac{۱۰}{x} = \frac{y}{z} = \frac{x}{۱۰ + m} \rightarrow x^۲ = ۱۰(۱۰ + m) \rightarrow m^۲ - ۱۰m + ۲۱ = ۰ \rightarrow m = ۳, ۷$

(۲)

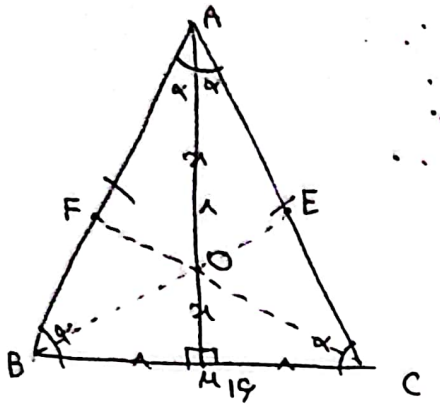
.6



$EF^2 = 16 = DF \times FC \rightarrow FC = 16$
$BF^2 = AF \times FC \rightarrow 4 \times 16 \rightarrow BF = 8$
$\rightarrow BC = 8\sqrt{5}$

(2)

.7



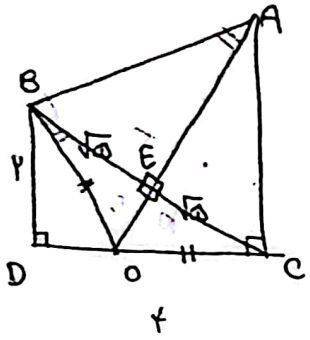
$\frac{OM}{OA} = \frac{1}{2} \rightarrow 3x = 8 \rightarrow x = \frac{8}{3} = OM \rightarrow AO = \frac{16}{3}$

$\sqrt{\frac{64}{9} + 64} = OB \rightarrow OB = \frac{8}{3}\sqrt{10}$

$\frac{OB}{OE} = \frac{2}{1} = \frac{\frac{8}{3}\sqrt{10}}{\frac{4}{3}\sqrt{10}} \rightarrow BE = 4\sqrt{10} = FC$

(2)

.8

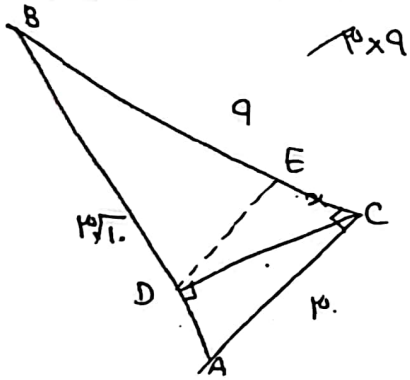


$\triangle BEC \cong \triangle EOC \rightarrow BE = EC \rightarrow BC = \sqrt{4+16} = 2\sqrt{5} \rightarrow BE = EC = \sqrt{5}$

$\frac{2}{\sqrt{5}} = \frac{4}{AE} = \frac{2\sqrt{5}}{5} \rightarrow AE = 4\sqrt{5} \rightarrow S_{ABE} = \frac{2\sqrt{5} \times \sqrt{5}}{2} = 5$

(3)

.9



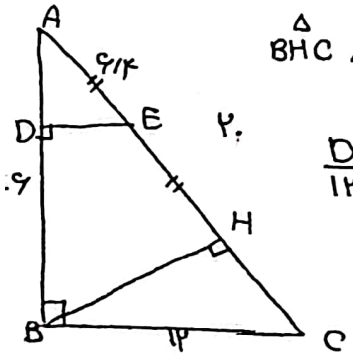
$30 \times 9 = 3\sqrt{10} \times DC \rightarrow DC = \frac{9}{10}\sqrt{10} \rightarrow DA^2 + \left(\frac{9}{10}\sqrt{10}\right)^2 = 9 \rightarrow DA = \frac{3\sqrt{10}}{10}$

$\frac{EC}{9} = \frac{3\sqrt{10}}{3\sqrt{10}} \rightarrow EC = 9$

$9 - 9 = 0$

(3)

.10



$\triangle BHC \sim \triangle ABC \rightarrow \frac{20}{12} = \frac{12}{CH} \rightarrow CH = 7/2 \rightarrow 20 - 7/2 = \frac{128}{2} = 64 = AE = EH$

$\frac{DE}{12} = \frac{64}{20} \rightarrow DE = 19/2$

(3)