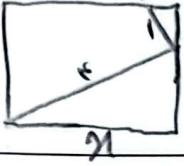


	۲۰. علیرضا $AC = 5 \Rightarrow y = \frac{4}{5}x$ $BC \parallel AE \Rightarrow \triangle BFE \sim \triangle AFE$ $\frac{EF}{BF} = \frac{AE}{BC} = \frac{AF}{FC} = \frac{1}{3}$ $BF = \sqrt{4x^2 + x^2} = \sqrt{5}x$ $4 \leq \sqrt{5}x \Rightarrow x \geq \frac{4}{\sqrt{5}}$ $\frac{EF}{AF} = \frac{\frac{4}{\sqrt{5}}x}{\frac{4}{\sqrt{5}}x} = \frac{\sqrt{4}}{3}$ ✓	۱
$\frac{1}{1+x} = \frac{x}{3} \Rightarrow x^2 + x - 3 = 0 \Rightarrow (x+4)(x-1) = 0$ $\Rightarrow x = 1$ ✓ $x = -4$ ✗	$x^2 + x - 3 = 0 \Rightarrow (x+4)(x-1) = 0$	۲
$\frac{y}{x} = \frac{4}{3}$ $1, y = 1x$ $\frac{3x}{x} = \frac{BC}{DE}$ $\frac{FC}{DE} = \frac{y}{x} = \frac{4}{3} \Rightarrow \frac{BC}{DE} = \frac{3+FC}{DE} \Rightarrow 3 = \frac{3}{DE} + \frac{4}{3}$ $\frac{3}{3} = \frac{3}{DE} \Rightarrow DE = 1 \Rightarrow BC = 3 \times \frac{1}{3} = 1$ ✓	$\frac{3}{3} = \frac{3}{DE} \Rightarrow DE = 1 \Rightarrow BC = 3 \times \frac{1}{3} = 1$ ✓	۳
	$BC^2 = 17^2 \Rightarrow BC = 17$ $AB^2 = 14^2 \Rightarrow AB = 14$ $\frac{AB}{BC} = \frac{14}{17} = \frac{1}{2}$ ✓	۴
$\frac{x}{1} = \frac{4}{1+x} \Rightarrow x^2 + 1x - 4 = 0 \Rightarrow (x+12)(x-1) = 0$ $\Rightarrow x = 1$ ✓ $x = -12$ ✗	$AF = 1 + 1 = 2$ ✓	۵

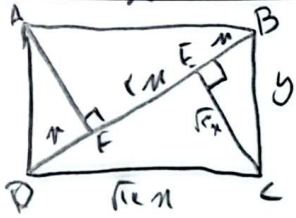
سوال 9

$$\frac{r}{1} = \frac{n}{\frac{n}{r}} \quad \frac{r}{1} = \frac{\frac{r}{r} n}{\frac{r}{r} n} \quad \left(\frac{r}{r} n \right)^2 + n^2 = r^2$$

$$\rightarrow \frac{r}{14} n^2 + n^2 = 14 \rightarrow \frac{r+14}{14} n^2 = 14 \rightarrow n^2 = \frac{14 \times 14}{r+14} = 10.14$$



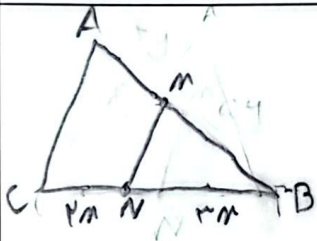
9



$$\frac{y}{14n} = \frac{n}{y} \rightarrow y = 14n$$

$$\frac{S_{ABC}}{S_{BCE}} = \frac{\frac{1}{2} \times 14n \times y}{\frac{1}{2} \times n \times \sqrt{14}n} = 1$$

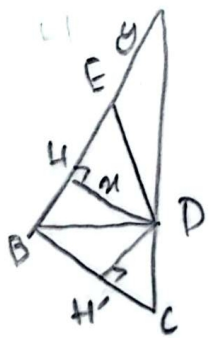
9



$$\frac{S_{ABC}}{S_{BMN}} = \frac{\frac{1}{2} \sin B \times AB \times BC}{\frac{1}{2} \sin B \times BM \times BN} = 1$$

$$\frac{AB}{BM} = \frac{1}{2} \rightarrow \frac{AB - BM}{BM} = \frac{1}{2} \rightarrow \frac{BM}{AM} = \frac{1}{2}$$

9



$$HD = DH' = 1$$

$$n^2 = n(1-n) \rightarrow n^2 = 11n \rightarrow n = 11$$

$$\frac{y + 11 \times 11}{11 + y} = \frac{11 \times 11}{11} \rightarrow 11y + 121 = 11 \times 11 + 11y$$

$$\rightarrow 11y = 11 \times 11 \rightarrow y = 11$$

9

$$FD = n \rightarrow GF = 14n \rightarrow GD = 14n \quad BG = 14n$$

$$\frac{BD}{FD} = \frac{14n}{n} = 14$$

9