

Diagram of a triangle ABC with a line segment MN parallel to the base AC. M is on side AB and N is on side BC. The segment MN is labeled 'm' and the base AC is labeled 'r'. The angle at vertex B is labeled 'B'.

$$\frac{BN}{NC} = \frac{m}{r}$$

$$\rightarrow \frac{1}{r} \times AB \sin \alpha = \frac{1}{r} \times BM \sin \alpha$$

$$\frac{AB}{BM} \cdot \frac{1}{\omega} \Rightarrow$$

$$\frac{B_M}{A_M} = \frac{\omega}{\epsilon}$$



$$\mathcal{E} \mathcal{Y} : \mathcal{E} x + \mathcal{Y} \rightarrow \nu \mathcal{Y}, \mathcal{E} x \rightarrow \mathcal{Y} : \frac{\mathcal{E}}{\mathcal{F}} \mathcal{X}$$

$$x^r + y^r: 1 \rightarrow x^r + \frac{14}{9} x^r: 1 \rightarrow \frac{r\omega}{9} x^r: 1 \rightarrow x: \frac{r}{9}$$

$$S = 14 \text{ yr} \cdot 14 \times \frac{14}{100} = 1.0, 1\%$$

$$y = \frac{c}{x}$$

A hand-drawn geometric diagram of a triangle \$ABC\$. The vertices are labeled \$A\$ (top), \$B\$ (bottom left), and \$C\$ (right). Three medians are drawn from each vertex to the midpoint of the opposite side: median \$AD\$ from \$A\$ to side \$BC\$, median \$BE\$ from \$B\$ to side \$AC\$, and median \$CF\$ from \$C\$ to side \$AB\$. The three medians intersect at a common point labeled \$G\$, which is the centroid of the triangle.

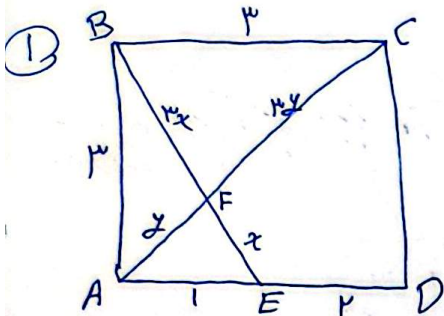
$$GB = \frac{1}{r} BD$$

$$FD = \frac{1}{2} GD \rightarrow FD = \frac{1}{2} \times \frac{1}{2} BD$$

$$\rightarrow 9FD: BD \rightarrow \frac{BD}{FD} \cdot 9$$

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$$\left. \begin{array}{l} \triangle ABC: (\varepsilon y)^r = 11 \\ \triangle ABE: (\varepsilon x)^r = 10 \end{array} \right\} \Rightarrow \frac{x^r}{y^r} \cdot \frac{11}{10} = \frac{9}{9} \rightarrow \frac{x}{y} = \frac{\sqrt{10}}{3}$$

Given



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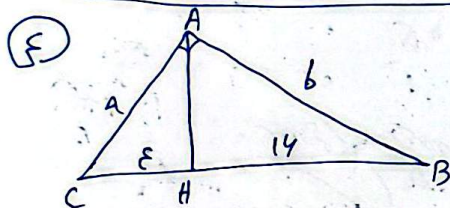
② $\triangle AED \sim \triangle ABC \Rightarrow \frac{y}{x+1} = \frac{x}{10} \rightarrow x^r + x = 30$
 $x^r + x - 30 = 0$
 $(x+4)(x-6) = 0 \rightarrow x = -4 \text{ or } 6$
 $x = 6$

③

$$\frac{x}{12} = \frac{z}{14} \rightarrow \frac{10}{12} z + 12 = 14z$$

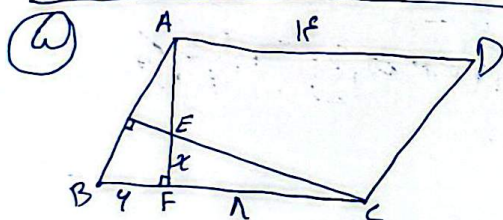
$$\frac{10}{12} z = \frac{14}{12} \times \frac{9}{5} = \frac{10}{5} = 2, 10$$

$$\rightarrow BF + FC = 12 + 10 = 22, 10$$



$$\frac{a^r}{b^r} = \frac{\varepsilon x^r}{14x^r} \Rightarrow \frac{b^r}{a^r} = \frac{14}{\varepsilon} \rightarrow \frac{b}{a} = \frac{14}{\varepsilon}$$

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$$\triangle FCE \sim \triangle FDB$$

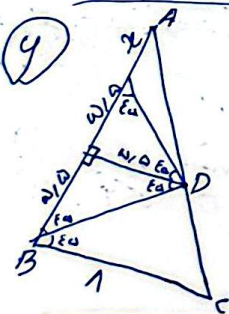
$$\frac{x}{4} = \frac{1}{x+1} \rightarrow x^r + 1x = 4$$

$$x^r + 1x - 4 = 0$$

$$(x+1)(x-4) = 0 \rightarrow x = 4$$

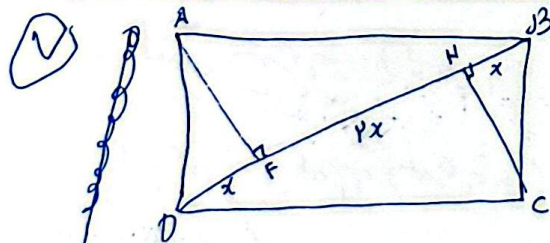
$$AF = 12$$

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$$\frac{x + \frac{10}{10}}{\frac{10}{10}} = \frac{10}{10} \rightarrow \frac{x}{10} = \frac{10}{10} \rightarrow x = 10$$

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$$BH = DF = \frac{1}{2} FH$$

$$\frac{S_{HBC}}{S_{BCD}} = \frac{1}{2} \rightarrow \frac{S_{HBC}}{S_{BCD}} \times \frac{S_{BCD}}{S_{ABCD}} = \frac{S_{HBC}}{S_{ABCD}} = \frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$$

$$\frac{S_{ABCD}}{S_{HBC}} = 4$$

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