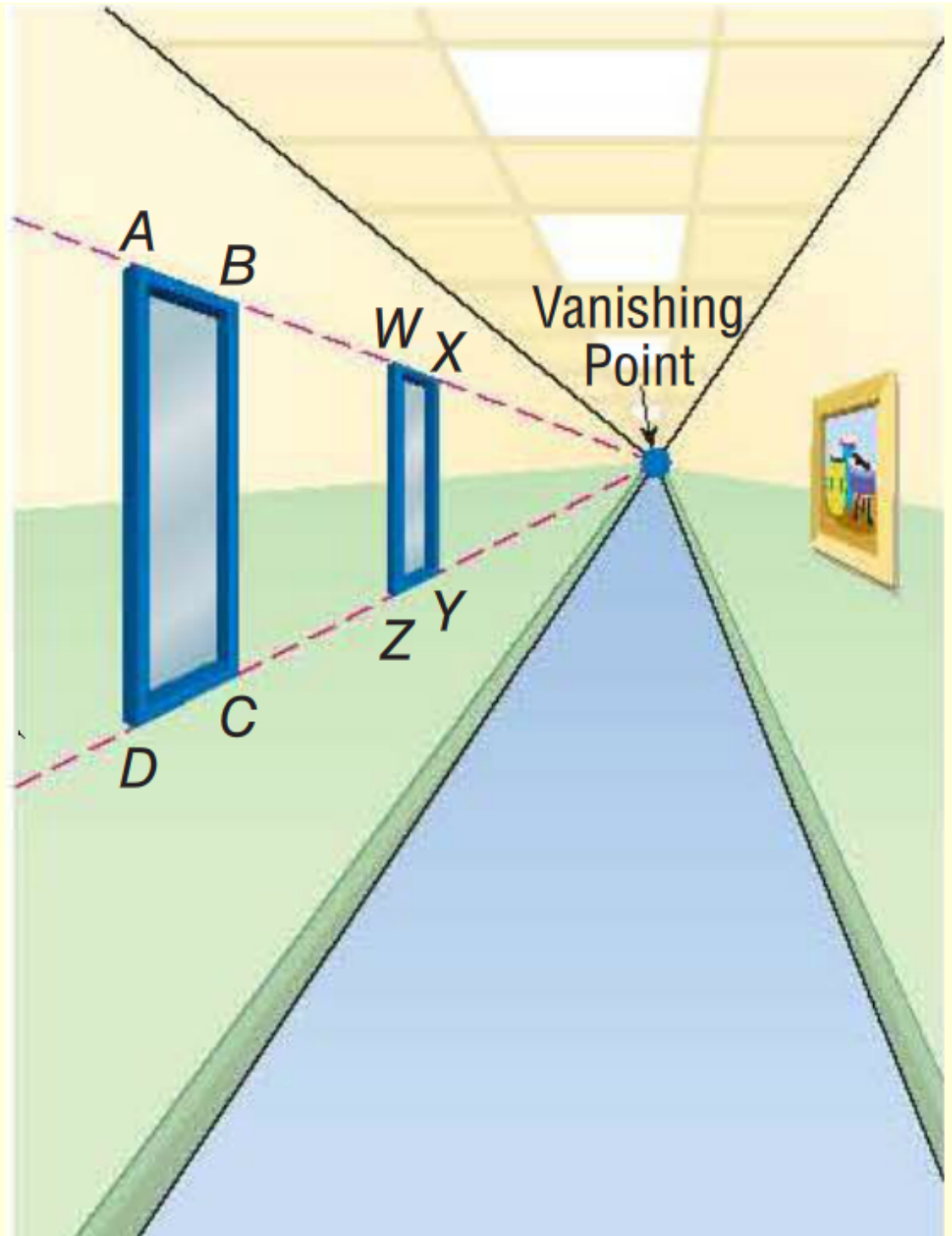


Lesson 7-4

Parallel lines and Proportional Parts

You will use proportional parts within triangles and with parallel lines.

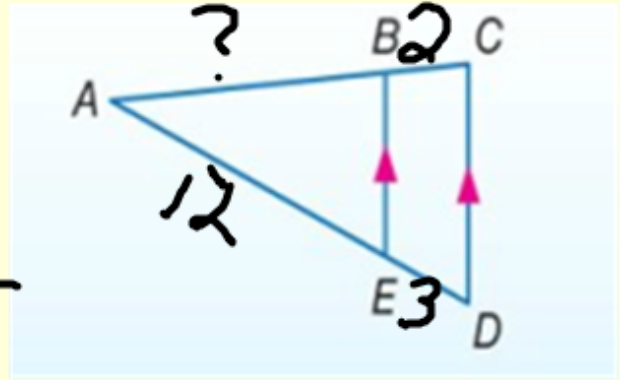


Triangle Proportionality

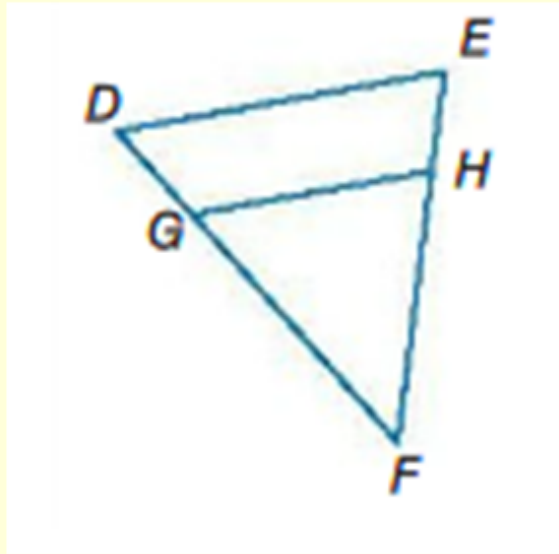
$$\frac{AE}{ED} = \frac{AB}{BC}$$

$$\frac{12}{3} = \frac{x}{2}$$

$$\frac{24}{3} = \frac{3x}{3} \quad x = 8$$



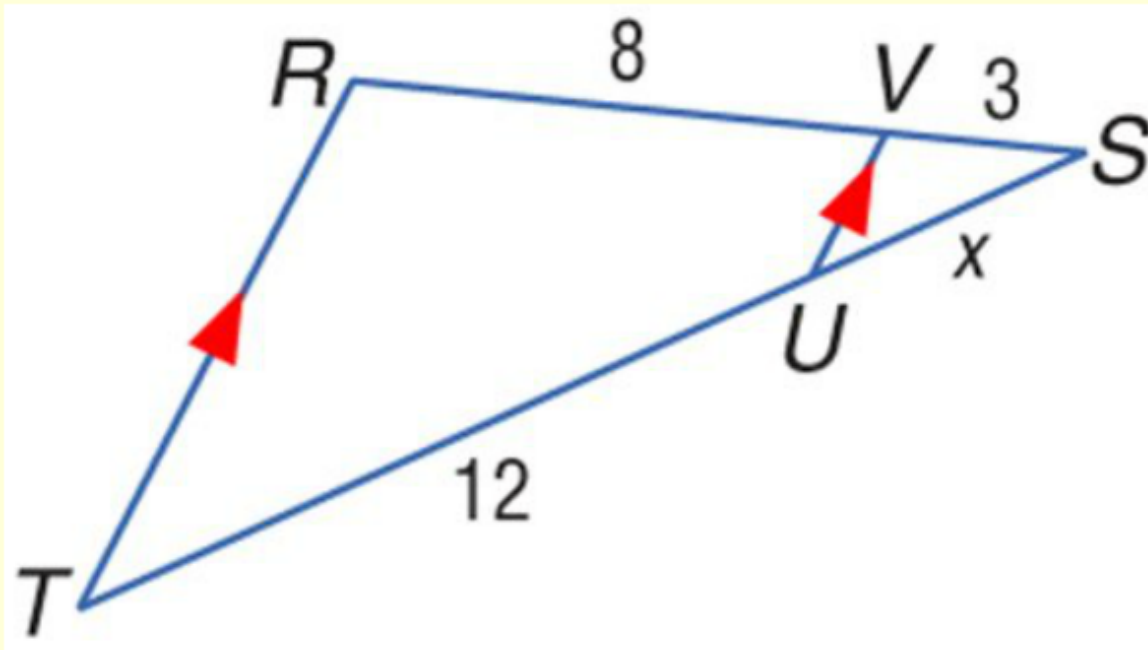
Converse of Proportionality



$$\text{If } \frac{GF}{GD} = \frac{HF}{HE}$$

Then $DE \parallel GH$

In $\triangle RST$, $\overline{RT} \parallel \overline{VU}$, $SV = 3$, $VR = 8$, and $UT = 12$. Find SU .



$$\frac{x}{12} = \frac{3}{8}$$

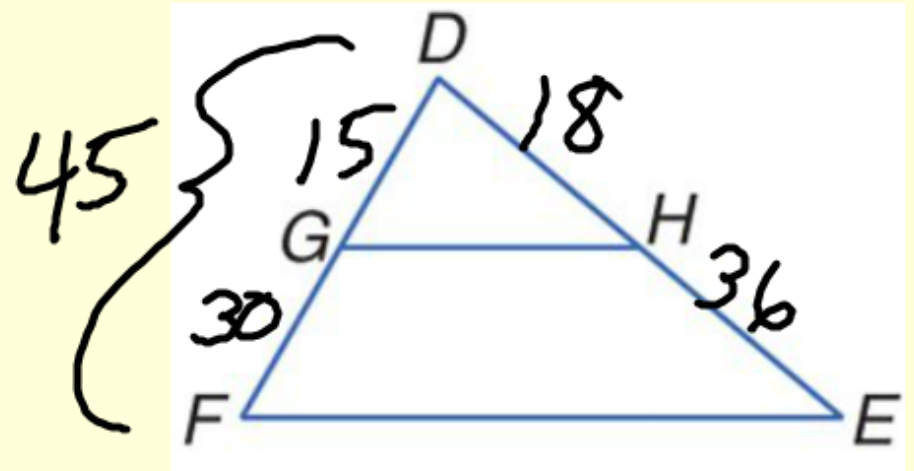
$$\frac{8x}{8} = \frac{36}{8}$$

$$x = 4.5$$

In $\triangle DEF$, $DH = 18$, $\underline{HE} = \underline{36}$, $DG = 15$ and $DF = 45$.
Determine whether $\overline{GH} \parallel \overline{FE}$. Explain.

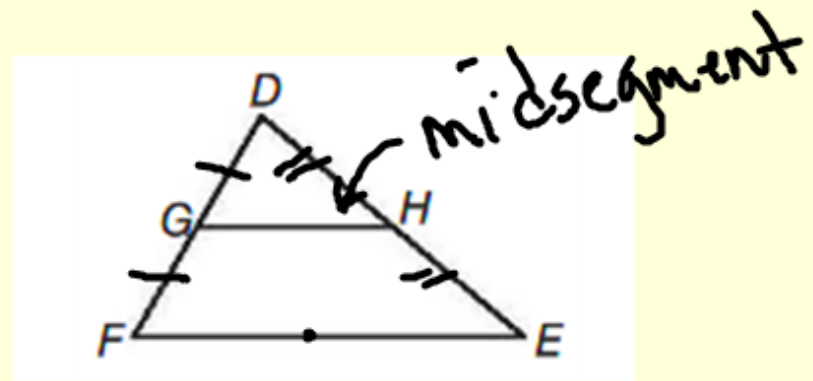
$$\frac{15?}{30} = \frac{18}{36}$$

$$\frac{1}{2} = \frac{1}{2} \checkmark \quad \text{yes}$$

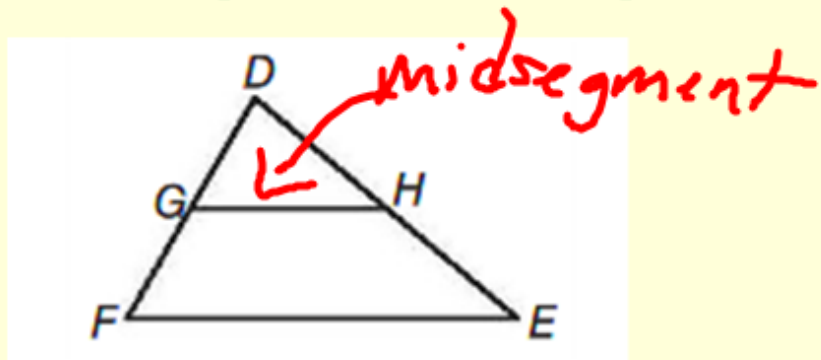


Midsegment

Connects the
midpoints



Triangle Midsegment Theorem



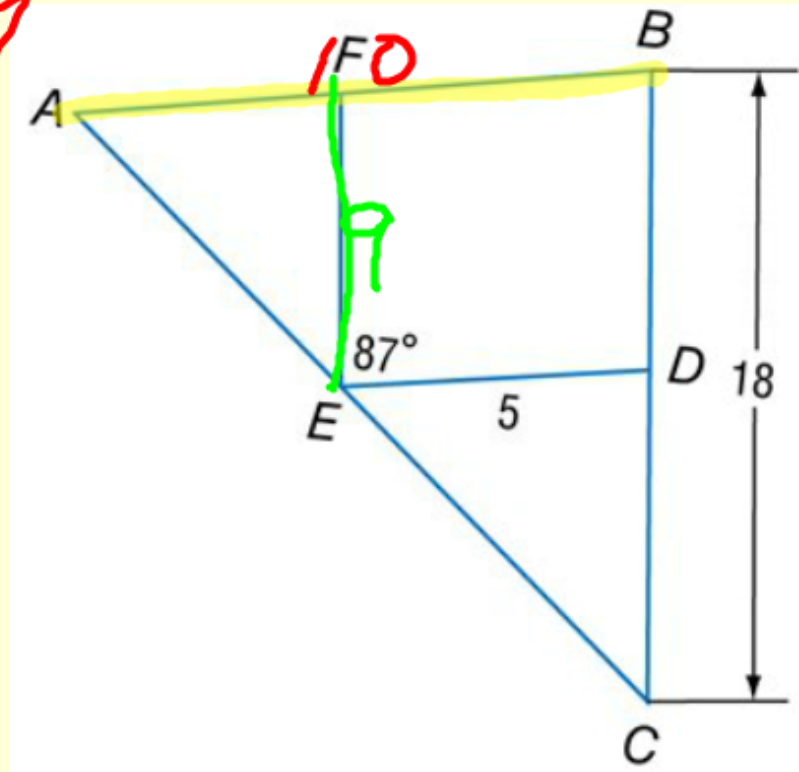
$$GH = \frac{1}{2} FE$$

$$2GH = FE$$

A. In the figure, \overline{DE} and \overline{EF} are midsegments of $\triangle ABC$. Find AB . Find FE .

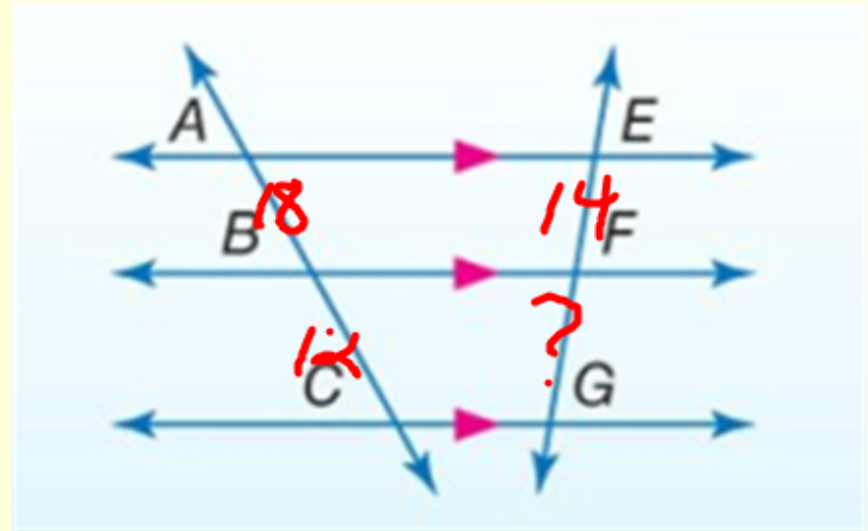
10

9



Proportional Parts of Parallel Lines

$$\frac{AB}{BC} = \frac{EF}{FG}$$

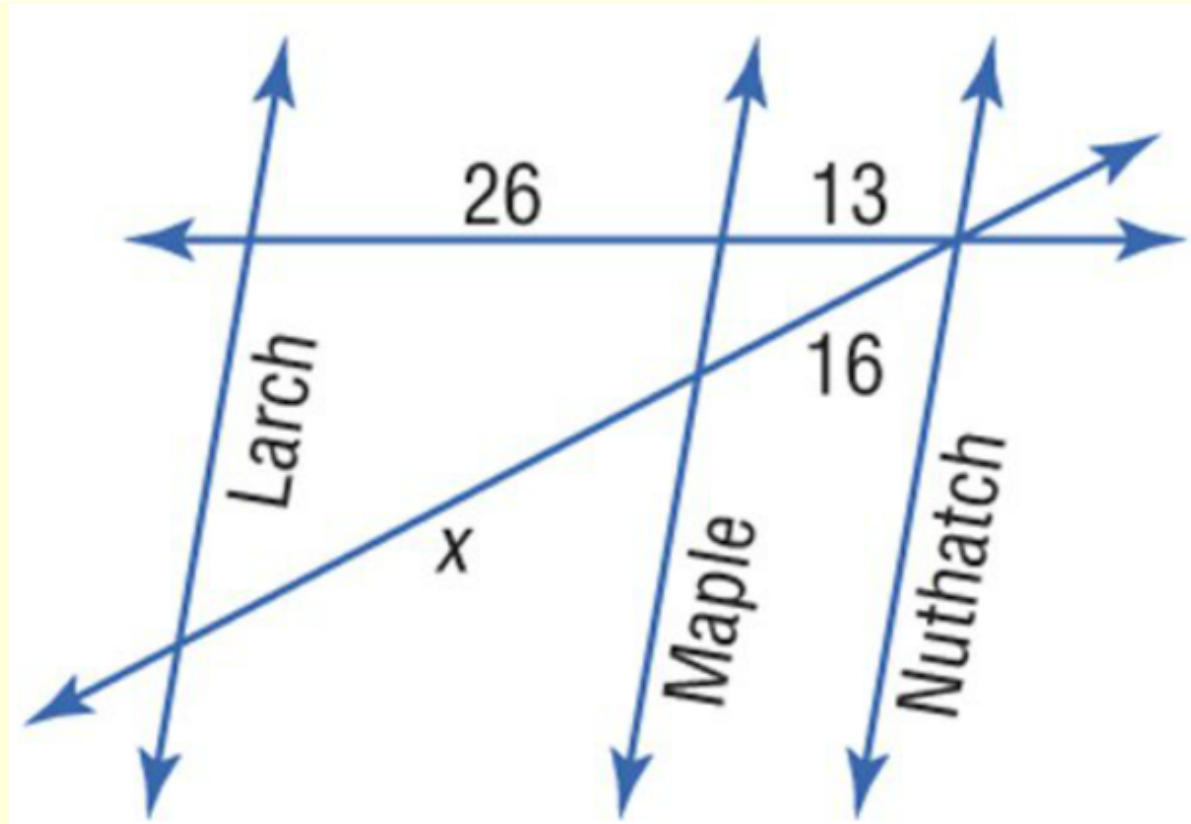


$$\frac{18}{12} \Rightarrow \frac{14}{x}$$

$$\frac{18x}{18} = \frac{168}{18}$$

$$x = 9.3$$

MAPS In the figure, Larch, Maple, and Nuthatch Streets are all parallel. The figure shows the distances in between city blocks. Find x .

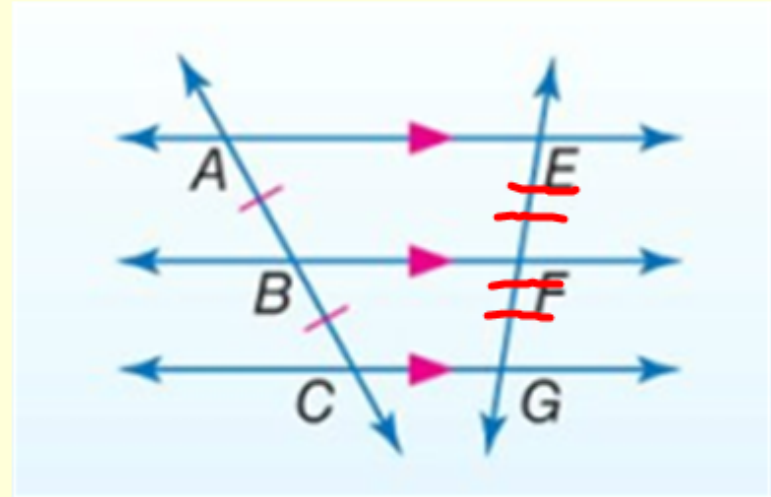


$$\frac{x}{26} = \frac{16}{13}$$

$$\frac{26}{13} = \frac{x}{16}$$

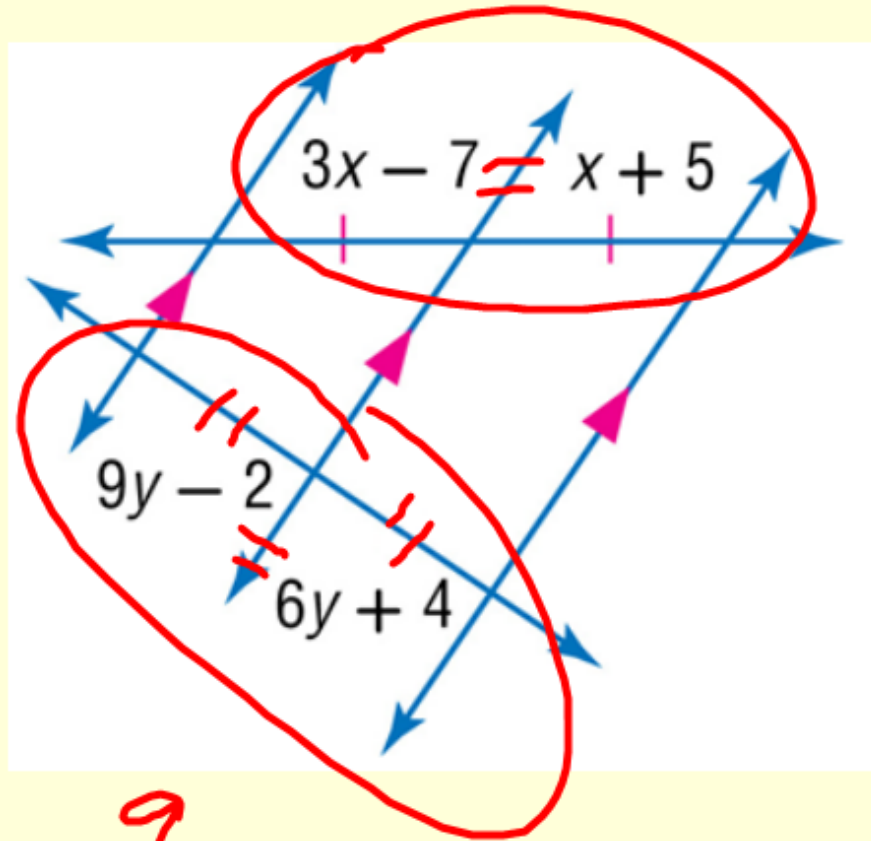
$$\frac{26}{13} \cdot \frac{16}{16} = \frac{13x}{13} \quad x = 32$$

Congruent Parts of Parallel Lines



Find x and y .

$$\frac{9y-2}{3x-7} = \frac{6y+4}{x+5}$$



$$9y - 2 = 6y + 4$$