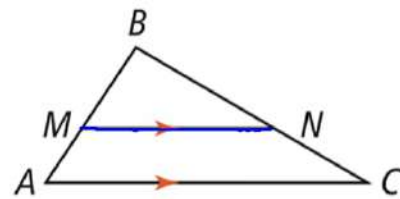


Side-Splitter Theorem

If a line is parallel to one side of a triangle and intersects the other two sides, then it divides those sides proportionally.

PROOF: SEE EXERCISE 14.

If... $\overline{MN} \parallel \overline{AC}$

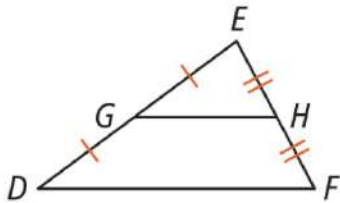


Then... $\frac{AM}{MB} = \frac{CN}{NB}$

Triangle Midsegment Theorem

If a segment joins the midpoints of two sides of a triangle, then the segment is parallel to the third side and is half as long.

If... $\overline{DG} \cong \overline{GE}$ and $\overline{FH} \cong \overline{HE}$

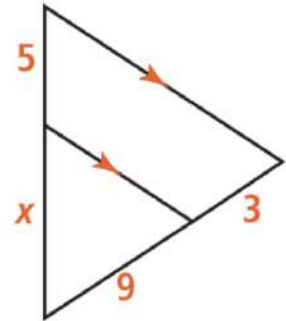


Then... $\overline{GH} \parallel \overline{DF}$ and $GH = \frac{1}{2}DF$

Manipulate the tool on the right and notice the relationship between the midsegment and the third side of the triangle.

Find the value of x .

Enter your answer.



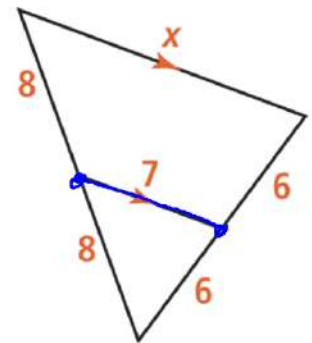
$$\frac{x}{5} = \frac{9}{3}$$

$$3x = 45$$

$$x = 15$$

Find the value of x .

Enter your answer.



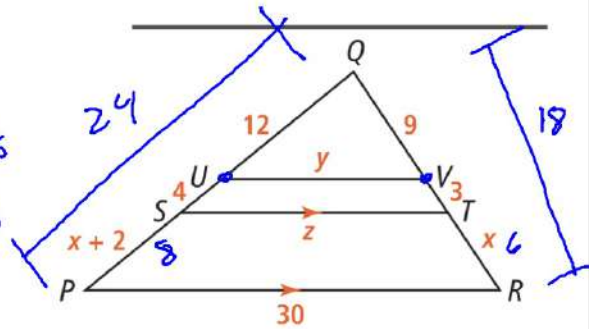
$$x = 14$$

What is the value of x in $\triangle PQR$?

SOLUTION

$$\begin{aligned}\frac{12}{9} &= \frac{x+2}{x} \\ 12x &= 9(x+2) \\ 12x &= 9x+18\end{aligned}$$

$$\begin{aligned}3x &= 18 \\ x &= 3\end{aligned}$$



What is the value of y ? Explain.

$$\frac{12}{y} = \frac{24}{30}$$

What is the value of z ? Explain.

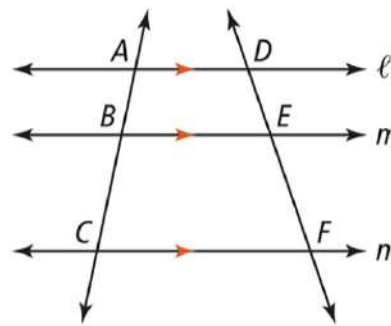
$$\frac{16}{z} = \frac{24}{30}$$

COROLLARY TO THE SIDE-SPLITTER THEOREM

If three parallel lines intersect two transversals, then the segments intercepted on the transversals are proportional.

PROOF: SEE EXERCISE 25.

If... $\ell \parallel m \parallel n$

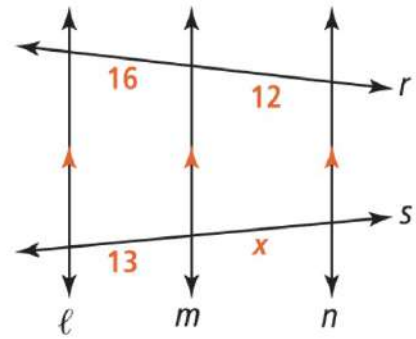


Then... $\frac{AB}{BC} = \frac{DE}{EF}$

Find the value of x .

Enter your answer.

CHECK ANSWER

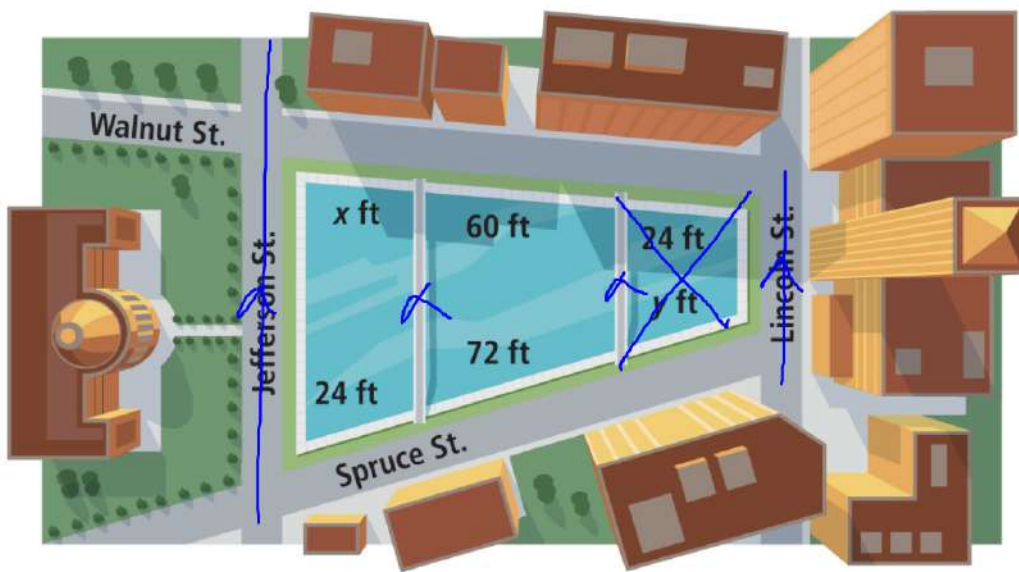


$$\frac{12}{x} = \frac{16}{13}$$

$$16x = 156$$

$$x = 9.75$$

A reflecting pool is separated by walkways parallel to Lincoln St. and Jefferson St., which are parallel to each other. The city wants to add additional tiling around the pool. How much tiling does x feet represent?



$$\frac{60}{72} = \frac{x}{24}$$

$$72x = 1440$$

$$x = 20 \text{ ft}$$

Find the value of x.

Enter your answer

$$\frac{2x+1}{x-1} = \frac{12}{8}$$

$$8(2x+1) = 12(x-1)$$

$$16x + 8 = 12x - 12$$

$$4x + 8 = -12$$

$$4x = -20$$

$$x = -5$$

