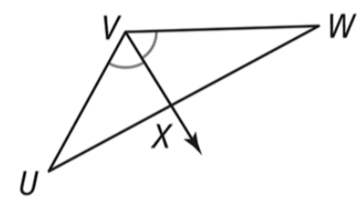
Triangle-Angle-Bisector Theorem

If a ray bisects an angle of a triangle, then it divides the opposite side into two segments that are proportional to the other two sides of the triangle.

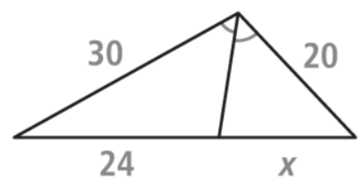
PROOF: SEE EXERCISE 16.

If... $\angle UVX \cong \angle WVX$



Then... $\frac{UX}{WX} = \frac{UV}{WV}$

Find the value of *x*.



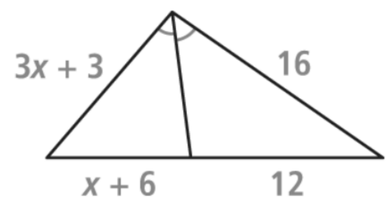
Enter your answer.

$$\frac{30}{24} = \frac{20}{x}$$

$$30x = 480$$

$$x = 16$$

Find the value of *x*.



Enter your answer

$$\frac{3x+3}{x+6} = \frac{16}{12}$$

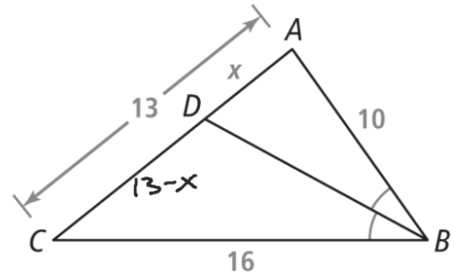
$$36x+36=16x+96$$

$$20x+36=96$$

$$20x=60$$

$$x=3$$

What are the values of *AD* and *DC*?



SOLUTION

$$\frac{10}{x} = \frac{16}{13-x}$$

$$130 - 10x = 16x$$

$$130 = 26x$$

$$x = 5$$

$$AD = 5$$

$$DC = 13 - 5$$
$$= 8$$

5. a. What is the value of x?

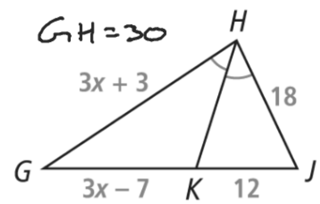
Enter your answer.

$$\frac{3x+3}{3x-7} = \frac{18}{12}$$

$$\frac{3x+3}{3x-7} = \frac{3}{2}$$

CHECK ANSWER

$$6x+6 = 9x-21$$
$$6 = 3x-21$$
$$27 = 3x$$
$$x = 9$$



GK= 20

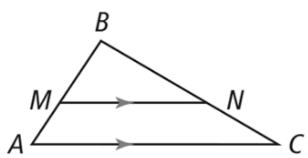
b. What are the values of GH and GK?

Proportions in Triangles

THEOREM 7-5

Side-Splitter Theorem

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

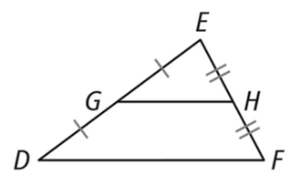


Then... $\frac{AM}{MB} = \frac{CN}{NB}$

THEOREM 7-6

Triangle Midsegment Theorem

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

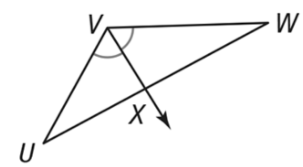


Then... $\overline{GH} \parallel \overline{DF}$ and $GH = \frac{1}{2}DF$

THEOREM 7-7

Triangle-Angle-Bisector Theorem

If... $\angle UVX \cong \angle WVX$



Then... $\frac{UX}{WX} = \frac{UV}{WV}$