

**Objectives:**

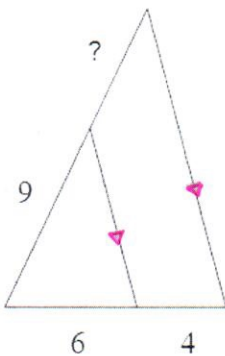
- I know how to apply the Triangle Proportionality theorem and the Angle Bisector theorem.

**Vocabulary:**

- Triangle Proportionality Theorem:**  
If a line parallel to one side of a triangle intersects the other two sides of the triangle, then the line divides these two sides proportionally.
- Angle Bisector Theorem:**  
An angle bisector of an angle of a triangle divides the opposite side in two segments that are proportional to the other two sides of the triangle.

**Example Set 1:**

1.

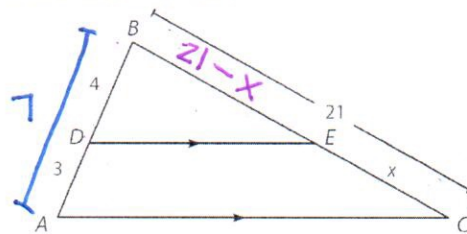


$$\frac{6}{4} = \frac{9}{?}$$

$$6 \cdot ? = \frac{36}{6}$$

$? = 6$

2. Find the length of  $\overline{EC}$



$$\frac{7}{3} = \frac{21}{x}$$

$$7x = 63$$

$$x = 9$$

OR

$$\frac{4}{3} = \frac{21-x}{x}$$

$$4x = 3(21-x)$$

$$4x = 63 - 3x$$

$$+3x \quad +3x$$

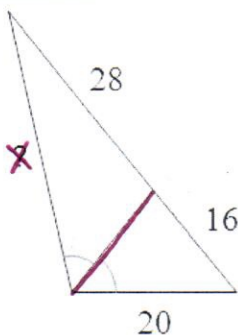

---


$$7x = 63$$

$$x = 9$$

**Example Set 2:**

1.



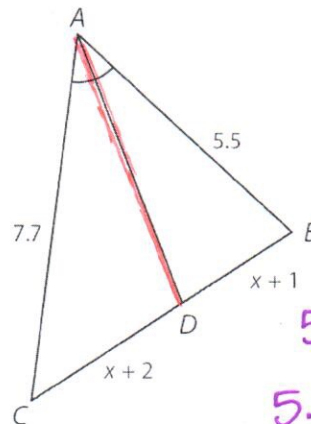
$$\frac{16}{20} = \frac{x}{28}$$

$$16x = 560$$

$$\frac{16x}{16} = \frac{560}{16}$$

$x = 35$

2.



$$\frac{x+2}{7.7} = \frac{x+1}{5.5}$$

$$5.5(x+2) = 7.7(x+1)$$

$$5.5x + 11 = 7.7x + 7.7$$

$$-7.7 \quad -7.7$$


---


$$5.5x + 3.3 = 7.7x$$

$$-5.5x \quad -5.5x$$


---

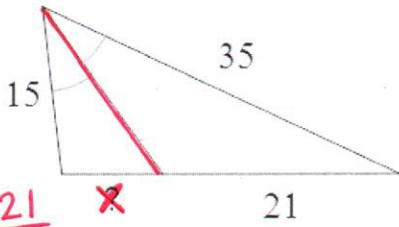

$$3.3 = 2.2x$$

$$\frac{3.3}{2.2} = \frac{2.2x}{2.2}$$

$x = 1.5$

**Practice Problems:** Solve for the missing variable

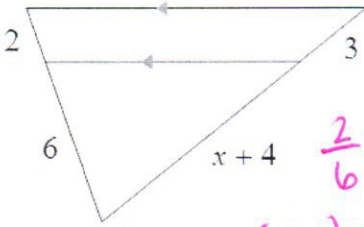
1.



$$\frac{x}{15} = \frac{21}{35}$$

$$\frac{35x}{35} = \frac{315}{35} \quad \boxed{x=9}$$

3.

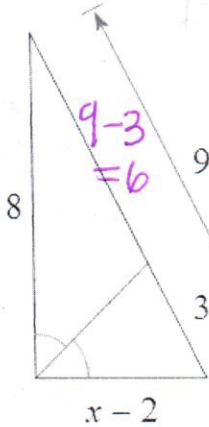


$$\frac{2}{6} = \frac{3}{x+4}$$

$$\begin{aligned} 2(x+4) &= 18 \\ 2x+8 &= 18 \\ -8 & \quad -8 \\ \hline 2x &= 10 \\ \frac{2x}{2} & \quad \frac{10}{2} \end{aligned}$$

$$\boxed{x=5}$$

5.

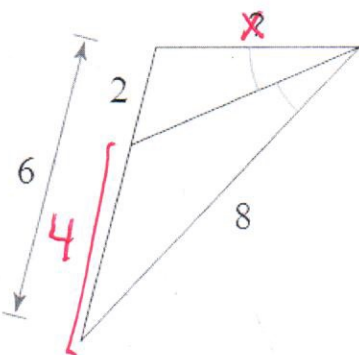


$$\frac{3}{x-2} = \frac{6}{8}$$

$$\begin{aligned} 24 &= 6(x-2) \\ 24 &= 6x-12 \\ +12 & \quad +12 \end{aligned}$$

$$\frac{36}{6} = \frac{6x}{6} \quad \boxed{x=6}$$

7.

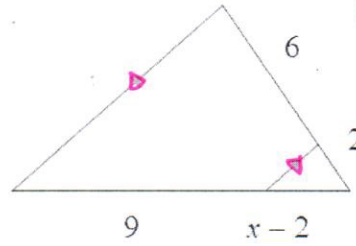


$$\frac{2}{x} = \frac{4}{8}$$

$$\frac{16}{4} = \frac{4x}{4}$$

$$\boxed{x=4}$$

2.



$$\frac{2}{6} = \frac{x-2}{9}$$

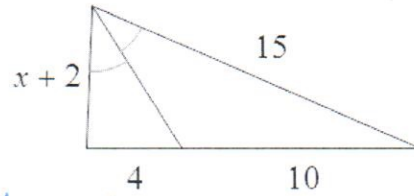
$$18 = 6(x-2)$$

$$18 = 6x - 12$$

$$\frac{30}{6} = \frac{6x}{6}$$

$$\boxed{x=5}$$

4.



$$\frac{4}{x+2} = \frac{6}{15}$$

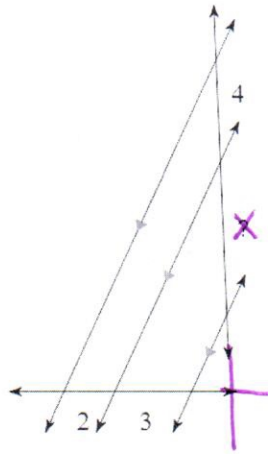
$$60 = 10(x+2)$$

$$60 = 10x + 20$$

$$\frac{40}{10} = \frac{10x}{10}$$

$$\boxed{x=4}$$

6.

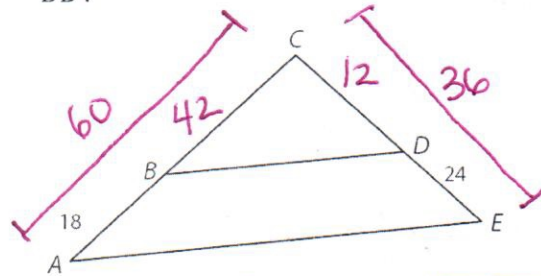


$$\frac{2}{3} = \frac{4}{x}$$

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

$$\boxed{x=6}$$

8. If  $\overline{AC} = 60$  units and  $\overline{EC} = 36$  units, is  $\overline{AE} \parallel \overline{BD}$ ?



$$\frac{42}{18} \neq \frac{12}{24}$$

$$1008 \neq 216$$

NOT PARALLEL!  
☺