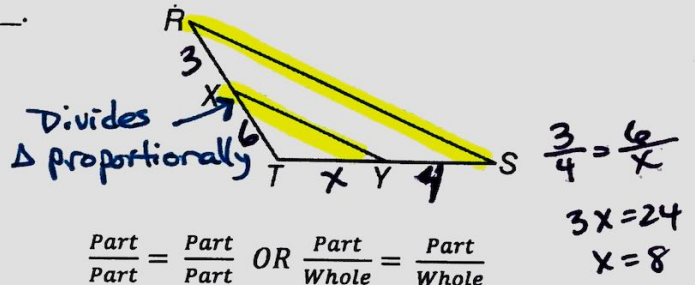


Proportional Parts of Triangles

- In any triangle, a line Parallel to one side of a triangle separates the other two sides proportionally.



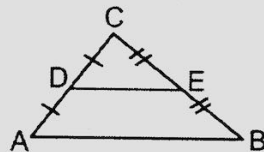
- The converse is also true.

If $\overline{XY} \parallel \overline{RS}$, then $\frac{RX}{XT} = \frac{SY}{YT}$. If $\frac{RX}{XT} = \frac{SY}{YT}$, then $\overline{XY} \parallel \overline{RS}$.

$$\frac{\text{Part}}{\text{Part}} = \frac{\text{Part}}{\text{Part}} \text{ OR } \frac{\text{Part}}{\text{Whole}} = \frac{\text{Part}}{\text{Whole}}$$

Midsegment of a Triangle

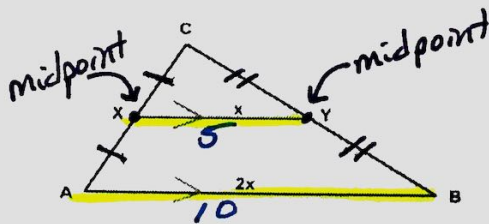
A Midsegment of a triangle is a segment joining the midpoints of the two sides of a triangle.



DE is a midsegment of ΔABC

Triangle Midsegment:

- Parallel to one side of a triangle.
- Is half the length of the parallel side.
- Connects to the midpoints



$$\overline{AB} \parallel \overline{XY}$$

$$XY = \frac{1}{2} AB \text{ or } AB = 2(XY)$$

CLASSWORK Proportional Parts Practice:

1. $\frac{5}{7} = \frac{5}{x}$
 $5x = 35$
 $x = 7$

2. $\frac{20}{18} = \frac{x}{9}$
 $18x = 180$
 $x = 10$

3. $\frac{35}{15} = \frac{x}{6}$
 $15x = 210$
 $x = 14$

4. $\frac{24}{30} = \frac{x}{10}$
 $30x = 240$
 $x = 8$

5. $\frac{x}{11} = \frac{x+12}{22}$
 $22x = 11(x+12)$
 $22x = 11x + 132$
 $11x = 132$
 $x = 12$

6. $\frac{x}{10} = \frac{x+10}{30}$
 $30x = 10(x+10)$
 $30x = 10x + 100$
 $20x = 100$
 $x = 5$

7. $\frac{5}{4} = \frac{8}{y+2}$
 $8y = 5(y+2)$
 $8y = 5y + 10$
 $3y = 10$
 $y = \frac{10}{3} = 3.3$

8. $\frac{5}{x+12} = \frac{3}{12}$
 $3(x+12) = 5(12)$
 $3x + 36 = 60$
 $3x = 24$
 $x = 8$

CLASSWORK Midsegments Practice:

1. Given DE is the length of the midsegment. What is its length?

$\frac{54}{2} = 27$

2. Given DE is the length of the midsegment. Find AB.

$8(2) = 16$

3. Given DE, DF, and FE are the lengths of midsegments. Find the perimeter of $\triangle ABC$. How does this compare to the perimeter of $\triangle DEF$?

Perimeter of $\triangle DEF = 18$
 Perimeter of $\triangle ABC = 36$
 $\triangle ABC$ is twice the perimeter of $\triangle DEF$

4. Solve for x and y.

Corresponding angles: $x = 60^\circ$
 Linear pair: $y = 180^\circ - 40^\circ = 140^\circ$

5. What is the perimeter of $\triangle TEN$?

Perimeter of $\triangle TEN = 9 + 8 + 6 = 23$

6. Solve for x.

$2(2x-11) = x+2$
 $4x - 22 = x + 2$
 $3x = 24$
 $x = 8$