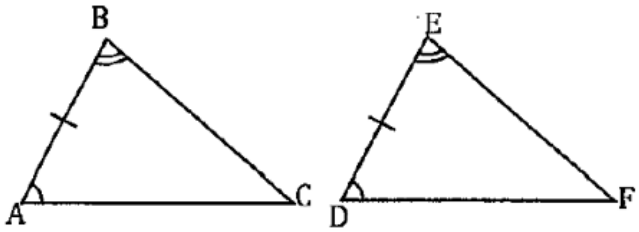
Warm-up:

0:00:00

1. Put your phones in the pouches/away
2. Complete your Warm-Up

1.

Given: $\overline{AB} \cong \overline{DE}$, $\angle B \cong \angle E$, and $\angle A \cong \angle D$

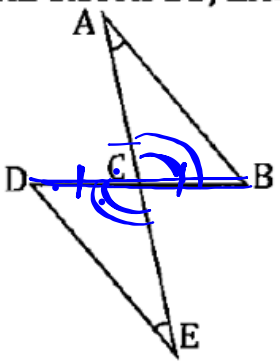


Prove: $\triangle ABC \cong \triangle DBC$

Statements	Reasons
1. $\overline{AB} \cong \overline{DE}$	1. Given
2. $\angle B \cong \angle E$	2. Given
3. $\angle A \cong \angle D$	3. Given
4. $\triangle ABC \cong \triangle DEF$	4. ASA

2.

Given: $\overline{AE}$ bisects $\overline{BD}$, $\angle A \cong \angle E$

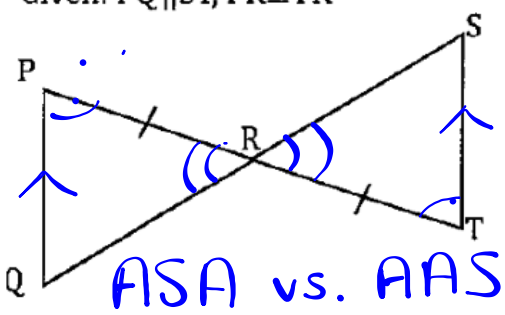


Prove: $\triangle ABC \cong \triangle EDC$

Statements	Reasons
1. $\angle A \cong \angle E$	1. Given
2. AE bisects BD	2. Given
3. $DC \cong CB$	3. Definition of Bisect
4. $\angle ACB \cong \angle DCE$	4. vert. angles are $\cong$
5. $\triangle ABC \cong \triangle EDC$	5. AAS

3.

Given: $\overline{PQ} \parallel \overline{ST}$, $\overline{PR} \cong \overline{TR}$

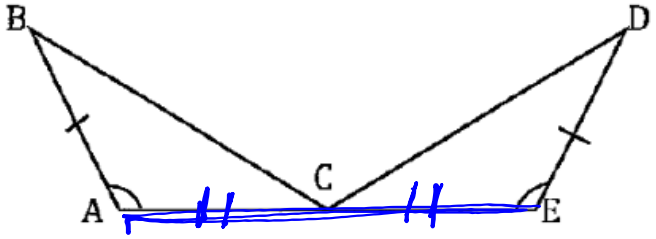


Prove: $\triangle PQR \cong \triangle TSR$

Statements	Reasons
1. $\overline{PR} \cong \overline{TR}$	1. Given
2. PQ ∥ ST	2. Given
3. $\angle P \cong \angle T$ PRQ SRT	3. Alt. int angles
4. $\angle \cancel{ACB} \cong \angle DCE$	4. vert. angles are $\cong$
5. $\triangle PQR \cong \triangle TSR$	5. ASA

4.

Given: C is the midpoint of $\overline{AE}$, $\overline{BA} \cong \overline{DE}$, and $\angle A \cong \angle E$



Prove: $BC \cong DC$

Statements	Reasons
C is the midpoint of AE	Given
$BA \cong DE$	Given
$\angle A \cong \angle E$	Given
$AC \cong CE$	Def. of midpoint
$\triangle ABC \cong \triangle EDC$	SAS
$BC \cong DC$	CPCTC

What am I learning today?

Learning Objective 2C.1

How to use the triangle proportionality theorem

What will I do to show that I have learned it?

I can...Use parallel lines in a triangle or 3 parallel lines cut with a transversal to create proportional sides

Triangle Proportionality Theorem

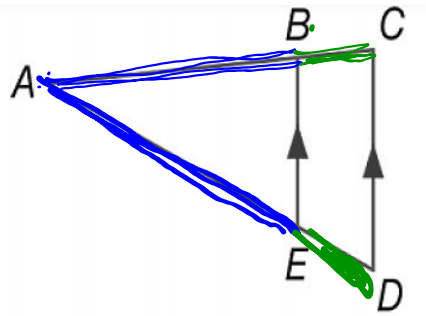
If a line is **PARALLEL** to one side of a triangle and it **INTERSECTS** the other two sides, then it divides the sides into segments of **PROPORTIONAL** lengths

If $\overline{BE} \parallel \overline{CD}$, then $\frac{AB}{BC} = \frac{AE}{ED}$

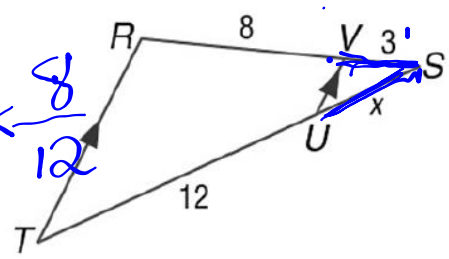
$\frac{\text{Blue}}{\text{Green}} = \frac{\text{Blue}}{\text{Green}}$

OR

$\frac{\text{Blue}}{\text{Blue}} = \frac{\text{Green}}{\text{Green}}$



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

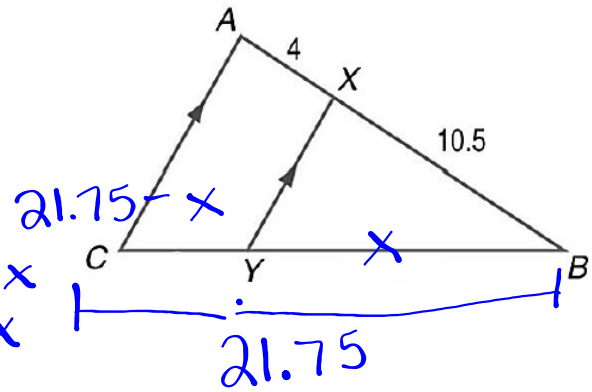


$\frac{3}{8} = \frac{x}{12}$ OR $\frac{3}{x} = \frac{8}{12}$

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

$x = 4.5$ $x = 4.5$

If $\overline{AC} \parallel \overline{XY}$, $AX = 4$, $XB = 10.5$, and $CB = 21.75$. Find BY.



$\frac{4}{21.75 - x} = \frac{10.5}{x}$

$4x = 228.375 - 10.5x$

$+10.5x$ $+10.5x$

$\frac{14.5x}{14.5} = \frac{228.375}{14.5}$

$x = 15.75$

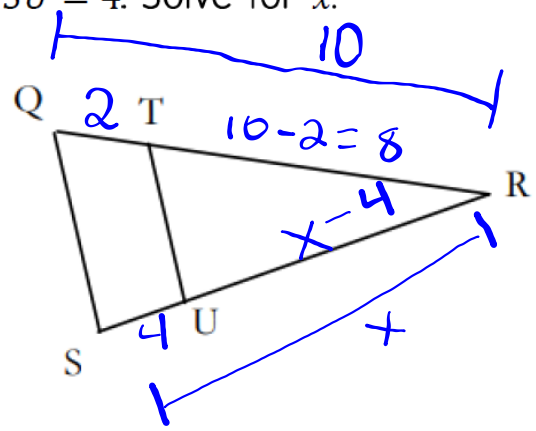
If $\overline{TU} \parallel \overline{QS}$, $QR = 10$, $QT = 2$, $SR = x$, and $SU = 4$. Solve for x.

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

$$32 = 2x - 8$$
$$+8 \qquad +8$$

$$\frac{40}{2} = \frac{2x}{2}$$

$$20 = x$$

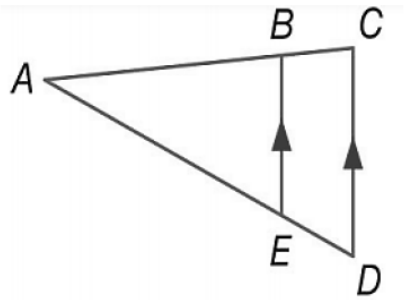


(REVERSE)

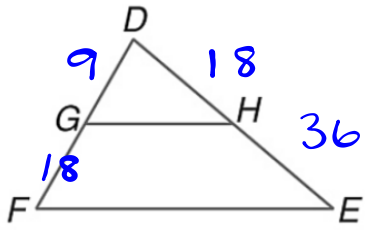
Converse of Triangle Proportionality Theorem

If a line intersects two sides of a triangle and separates the sides into **PROPORTIONAL** corresponding segments, then the line is **PARALLEL** to the third side of the triangle.

If $\frac{AB}{BC} = \frac{AE}{ED}$, then $\overline{BE} \parallel \overline{CD}$



$DH = 18$, $HE = 36$, $DG = 9$, and ~~DE~~ GF $= 18$. Determine if $\overline{GH} \parallel \overline{FE}$. ✓



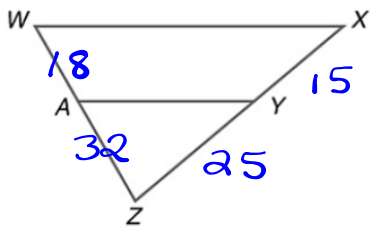
$$\frac{9}{18} \neq \frac{18}{36}$$

$$324 = 324$$

✓

$XY = 15$, $YZ = 25$, $WA = 18$, and $AZ = 32$. Determine if $\overline{WX} \parallel \overline{AY}$.

No!



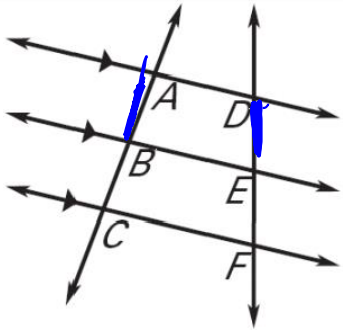
$$\frac{18}{15} \neq \frac{32}{25}$$

$$450 \neq 480$$

Two-Transversal Proportionality

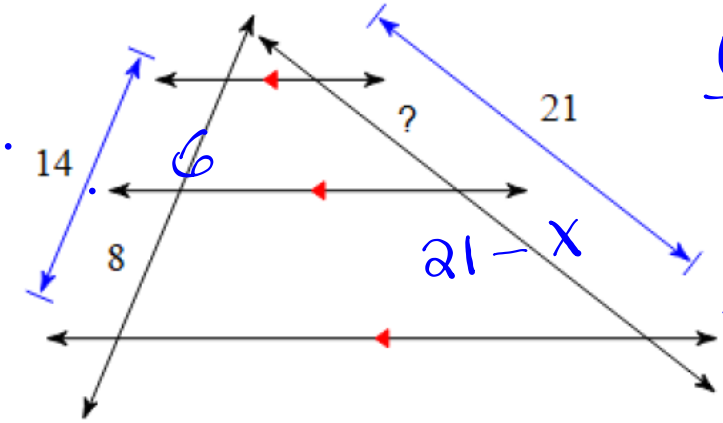
If **3** or more parallel lines intersect **2** transversals, then they divide the transversals **PROPORTIONALLY**

If $\overleftrightarrow{AD} \parallel \overleftrightarrow{BE} \parallel \overleftrightarrow{CF}$, then $\frac{AB}{BC} = \frac{DE}{EF}$



Example:

Solve for the missing length.



$\frac{6}{8} = \frac{x}{21-x}$

$8x = 126 - 6x$

$+6x \quad +6x$

$\frac{14x}{14} = \frac{126}{14}$

$x = 9$

Classwork:

Complete the classwork about using triangle proportionality.

HW: On top of the bin.