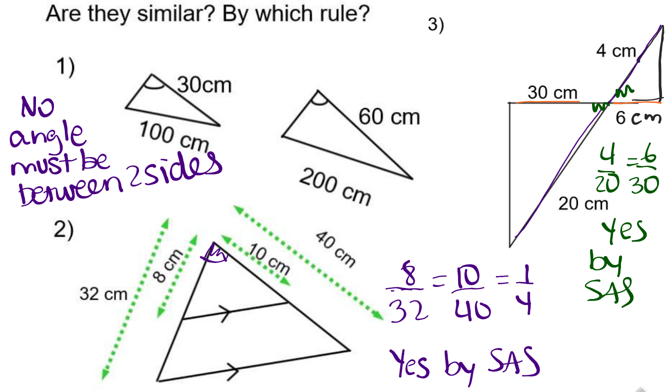
Are they similar? By which rule?



1) No angle must be between 2 sides

2) $\frac{8}{32}=\frac{10}{40}=\frac{1}{4}$

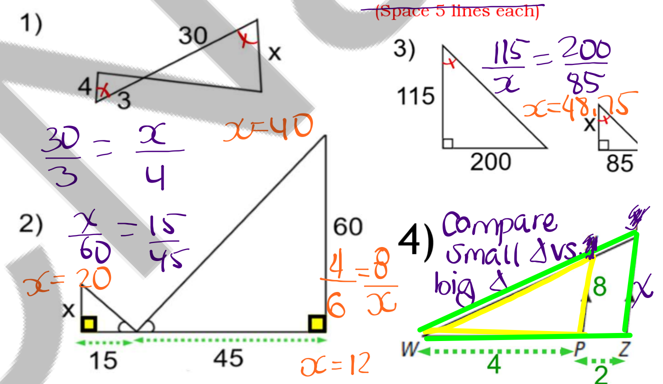
Yes by SAS

3) $\frac{4}{20}=\frac{6}{30}$

yes by SAS

Determine the value of x, if similarity exists

~~(Space 5 lines each)~~



1) $\frac{30}{3}=\frac{x}{4}$ $x=40$

2) $\frac{x}{60}=\frac{15}{45}$ $x=20$

3) $\frac{115}{x}=\frac{200}{85}$ $x=48.75$

4) Compare small Δ vs. big Δ

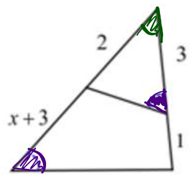
$\frac{4}{6}=\frac{8}{x}$ $x=12$

5) Determine the value of x.

At any point, if you want to prove similarity/cong, make a statement/just.

$\frac{2}{4} = \frac{3}{x+5}$

$x = 1$

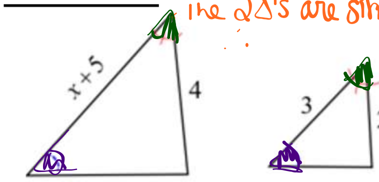


Triangles are similar by A

Separate the triangles and make their orientations the same.

Solution

The △'s are similar by AA.



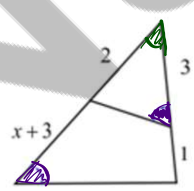
Set up and solve the proportion

5) Determine the value of x.

At any point, if you want to prove similarity/cong, make a statement/just.

$\frac{2}{4} = \frac{3}{x+5}$

$x = 1$

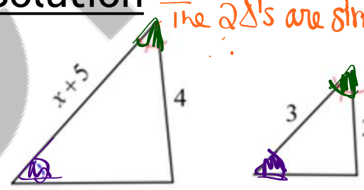


Triangles are similar by A

Separate the triangles and make their orientations the same.

Solution

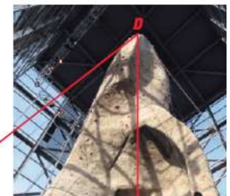
The △'s are similar by AA.

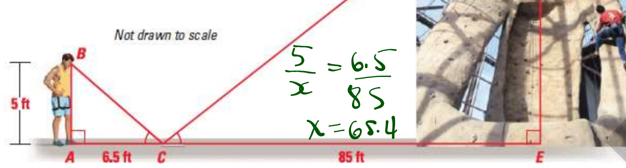


Set up and solve the proportion

If time permits, real life situation.

ROCK CLIMBING You are at an indoor climbing wall. To estimate the height of the wall, you place a mirror on the floor 85 feet from the base of the wall. Then you walk backward until you can see the top of the wall centered in the mirror. You are 6.5 feet from the mirror and your eyes are 5 feet above the ground. Use similar triangles to estimate the height of the wall.





$\frac{5}{x} = \frac{6.5}{85}$

$x = 65.4$

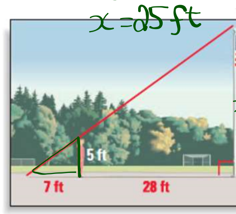
If time permits, real life situation.

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

$x = 25$ ft

FLAGPOLE HEIGHT
Julia uses the shadow of the flagpole to estimate its height. She stands so that the tip of her shadow coincides with the tip of the flagpole's shadow as shown. Julia is 5 feet tall. The distance from the flagpole to Julia is 28 feet and the distance between the tip of the shadows and Julia is 7 feet.

Calculate the height of the flagpole.



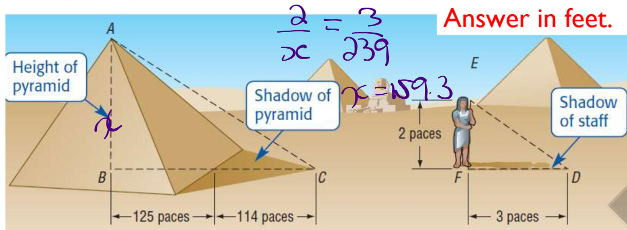
If time permits, real life situation.

HISTORY The Greek mathematician Thales was the first to measure the height of a pyramid by using geometry. He showed that the ratio of a pyramid to a staff was equal to the ratio of one shadow to the other. If a p
is about 3 feet, approximately how tall was the pyramid at that time?

Answer in feet.

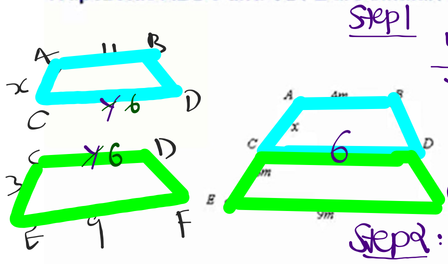
$\frac{2}{x} = \frac{3}{239}$

$x = 159.3$



Homework p204#1-8

Trapezoids ABDC and CDFE are similar. What is $m\overline{AC}$?



Step 1

$$\frac{4}{Y} = \frac{Y}{9}$$

$$Y^2 = 36$$

$$Y = 6$$

Step 2:

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

$$x = 2$$

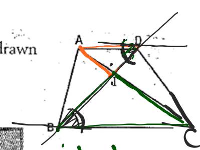
Proofs

Ex 1:

In the trapezoid ABCD on the right, diagonals AC and BD are drawn intersecting at I.

Justify the steps proving that AID and CIB are similar.

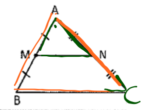
Hypothesis: ABCD is a trapezoid.



Statement	Justification
1. AD // BC	ABCD is a trapezoid (hypothesis) given
A 2. $\angle ADI \cong \angle IBC$	alternate interior angles are cong.
A 3. $\angle AID \cong \angle BIC$	vertically opp. angles are cong.
4. $\Delta AID \cong \Delta CIB$	A A

Ex 2:

onsider triangle ABC and segment MN joining the mid-points of sides AB and C.



a) Complete the steps proving that triangles AMN and ABC are similar.

Hypothesis: *M is the mid-point of $\overline{AB}$*
N is the mid-point of $\overline{AC}$

Statement	Justification
1. $\angle MAN \cong \angle BAC$	share a common angle
2. $\frac{m\overline{AM}}{m\overline{AB}} = \frac{m\overline{AN}}{m\overline{AC}} = \frac{1}{2}$	M is midpoint of $\overline{AB}$. N is midpoint of $\overline{AC}$
3. $\Delta AMN \sim \Delta ABC$	SAS.

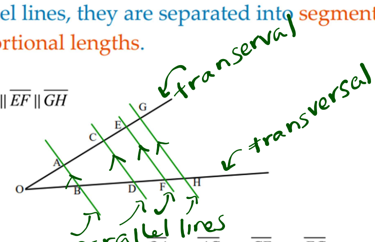
Homework page p 207 #9-14

7.4 Solving geometric problems pg. 211-215

Thales' Theorem

When two transversal lines are intersected by parallel lines, they are separated into segments of proportional lengths.

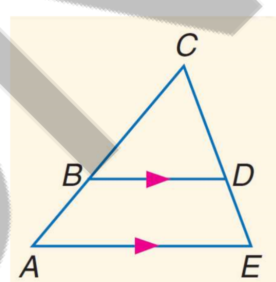
$\overline{AB} \parallel \overline{CD} \parallel \overline{EF} \parallel \overline{GH}$



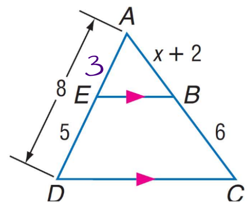
$$\therefore \frac{m\overline{OA}}{m\overline{OB}} = \frac{m\overline{AC}}{m\overline{BD}} = \frac{m\overline{CE}}{m\overline{DF}} = \frac{m\overline{EG}}{m\overline{FH}} \cdots$$

Thales Theorem* sides given

If $\overline{BD} // \overline{AE}$, then $\frac{\overline{BC}}{\overline{AB}} = \frac{\overline{CD}}{\overline{DE}}$



Ex: Find the Value of x.

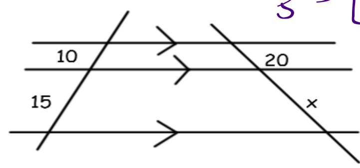


$\frac{3}{5} = \frac{x+2}{6}$

$18 = 5x + 10$

$\frac{8}{5} = \frac{5x}{5}$

$\boxed{x = 8/5}$



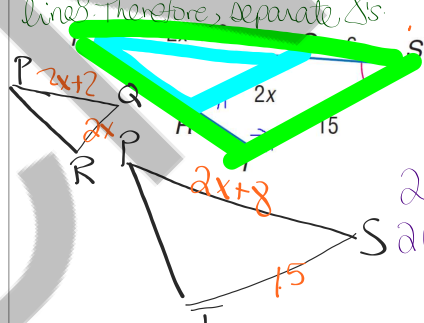
$\frac{10}{15} = \frac{20}{x}$

$300 = 10x$

$\boxed{x = 30}$

Example: Explain why Thales Theorem does NOT apply and then solve for x.

It's given are on the parallel lines. Therefore, separate Δ's.



$\frac{2x+2}{2x+8} = \frac{2x}{15}$

$4x^2 + 16x = 30x + 30$

$4x^2 - 14x - 30 = 0$

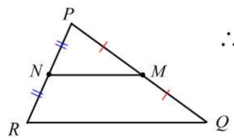
$2(2x^2 - 7x - 15) = 0$

$2(2x+3)(x-5) = 0$

$x = 5$

Segment Joining the Mid-Points of Two Sides of Triangle

Any line segment that joins the midpoints of two sides in a triangle is parallel to the third side and is half the length of this third side.



$\therefore \overline{NM} \parallel \overline{RQ}$

$m\overline{NM} = \frac{1}{2} m\overline{RQ}$

Homework p212 #1 to 13