3/26 Aim Proving Triangles similar
Do now Homework out
Sheet of notebook paper
Highlighters
Cheat sheet
do now Proof

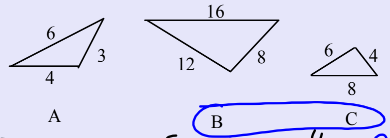
Homework: TBA

Test Wednesday
Test Tuesday and Wednesday

Jan 8-9:54 AM

1. For each part (a) through (d) below, state which of the three triangles, if any, similar and why.

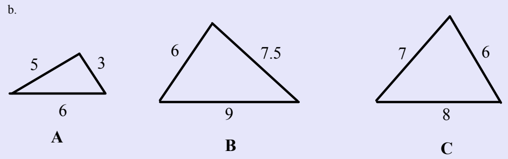
a. SSS similarity



$\frac{3}{4} = \frac{3}{4}$ $\frac{8}{12} = \frac{2}{3}$ $\frac{4}{6} = \frac{2}{3}$

Jan 7-11:10 AM

b.

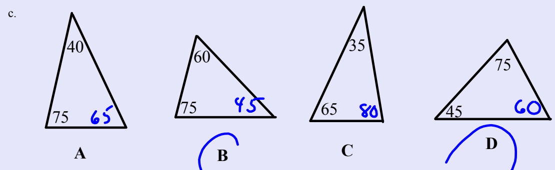


$\frac{3}{5}$ $\frac{6}{7.5}$ $\frac{6}{7}$

None!

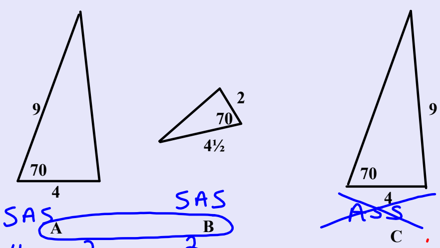
Jan 7-11:10 AM

c.



find ∢

Jan 7-11:10 AM



SAS SAS ~~ASS~~

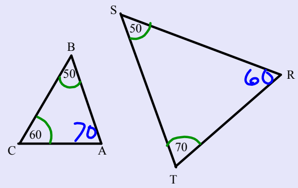
A B C

$\frac{4}{9} = \frac{2}{4.5}$ $\frac{2}{4\frac{1}{2}}$

SAS similarity

Jan 7-11:10 AM

2. For each given pair of triangles, determine if the triangles are similar or not, and provide your reasoning. If the triangles are similar, write a similarity statement relating the triangles.



AA $\triangle ABC \sim \triangle TSR$

Jan 7-11:10 AM

Similar Triangles ~

- angles are congruent
- sides are proportional

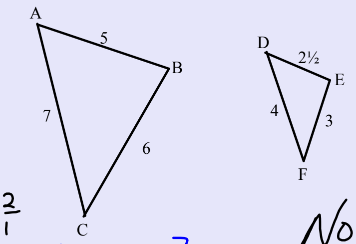
3 ways to prove △'s ~

① AA

② SSS – all 3 sides are proportional

③ SAS – two sides proportional, included ∡ ≅.

Mar 27-12:49 PM



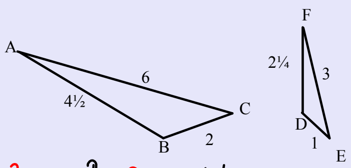
$\frac{5}{2.5} = \frac{2}{1}$

$\frac{6}{3}$ $\frac{2}{1}$ $\frac{7}{4} = \frac{7}{4}$

No

Jan 7-11:10 AM

c.

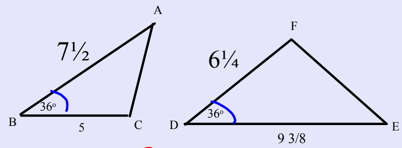


$\frac{6}{3}$ $\frac{2}{1}$ $\frac{2}{1} = \frac{2}{1}$ $\frac{4\frac{1}{2}}{2\frac{1}{4}} = \frac{2}{1}$

SSS similarity

Jan 7-11:10 AM

d.



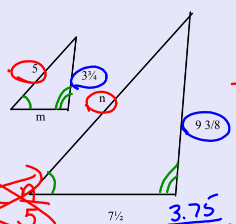
$\frac{7\frac{1}{2}}{9\frac{3}{8}} = .8$ $\frac{5}{6\frac{1}{4}} = .8$

SAS similarity

Jan 7-11:10 AM

3. For each pair of similar triangles below, determine the unknown lengths of the sides labeled with letters.

a.



$\frac{3\frac{3}{4}}{9\frac{3}{8}}$

$\frac{3.75}{9.375} = \frac{5}{n}$

$\frac{46.875}{3.75} = \frac{3.75n}{3.75}$

$\boxed{n = 12.5}$

~~9.375~~ ~~3.75~~ ~~5~~

$\frac{5}{3.75} = \frac{n}{9.375}$

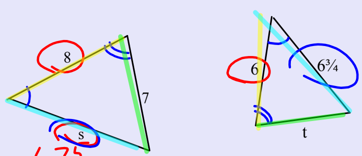
$\frac{3.75}{9.375} = \frac{m}{7.5}$

$\frac{7.5(3.75)}{9.375} = \frac{9.375m}{9.375}$

$m = 3$

Jan 7-11:10 AM

b.



$\frac{6}{8} = \frac{6.75}{s}$

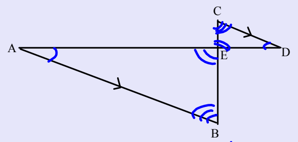
$s = 9$

$\frac{6}{8} = \frac{t}{7}$

$t = 5.25$

Jan 7-11:10 AM

4. Given that $\overline{AD}$ and $\overline{BC}$ intersect at E, and $\overline{AB} \parallel \overline{CD}$, show that $\Delta ABE \sim \Delta DCE$



$\angle AEB \cong \angle DEC$
Vertical $\angle$'s $\cong$

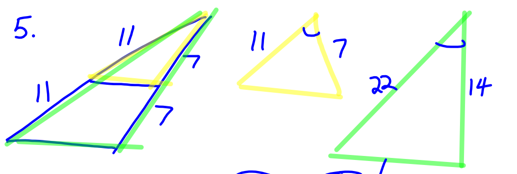
// lines cut by a transversal form $\cong$ alternate interior $\angle$'s

$\angle A \cong \angle D$
$\angle B \cong \angle C$

$\Delta ABE \sim \Delta DCE$

Jan 7-11:10 AM

5.



SAS for similarity

$\frac{11}{7} = \frac{22}{14}$

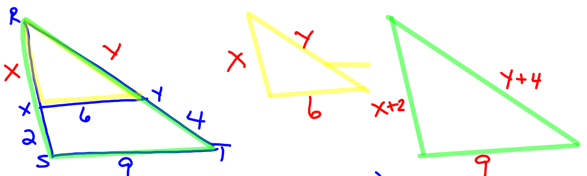
$\frac{11}{22} = \frac{7}{14}$

$\frac{11}{7} = \frac{11}{7}$ ✓

$22 \cdot 7 = 11 \cdot 14$

$154 = 154$

Mar 27-1:08 PM



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

$6(x+2) = 9x$

$6x + 12 = 9x$

$-6x \quad -6x$

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

$4 = x$

$\frac{y}{6} = \frac{(y+4)}{9}$

$9y = 6y + 24$

$-6y \quad -6y$

$3y = 24$

$y = 8$

Mar 27-1:11 PM

On your paper

What makes two triangles similar?

Feb 17-8:44 AM

What makes two triangles similar?

Triangles are similar if corresponding angles are congruent and corresponding sides are in proportion.

They look alike but can differ in size, orientation, placement and position.

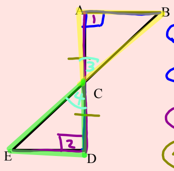
Feb 17-8:44 AM

do proof in packet

Mar 27-3:18 PM

Do now: Prove ΔABC ΔDEC

Given: $\overline{AD}$ perpendicular to $\overline{AB}$
$\overline{DA}$ perpendicular to $\overline{ED}$
$\overline{BE}$ bisects $\overline{AD}$



Statements	Reasons
1 AD ⊥ AB DA ⊥ ED BE biscuts AD	1 Given
2 ∡1 and ∡2 are right ∡'s	2 ⊥ lines form right ∡'s
3 ∡1 ≅ ∡2	3 All right ∡'s are ≅
4 AC ≅ CD	4 Defn. of bisector
5 ∡3 ≅ ∡4	5 Vertical ∡'s are ≅
6 ΔABC ≅ ΔDEC	6 ASA ≅ ASA

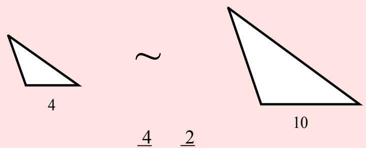
Jan 8-9:55 AM

on your notebook paper

Mar 27-3:18 PM

The **ratio of similitude** is the comparison of the lengths of corresponding sides in reduced form.

copy



$\frac{4}{10} = \frac{2}{5}$

The ratio of similitude is 2:5

Feb 17-8:51 AM

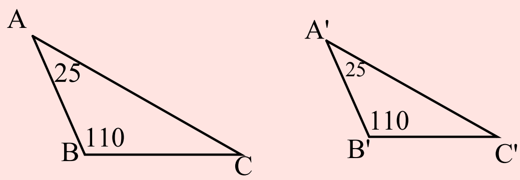
Triangles are similar, angles are congruent.

COPY

$\Delta ABC \sim \Delta A'B'C'$

<A   <A'

<B   <B'



Feb 17-8:59 AM

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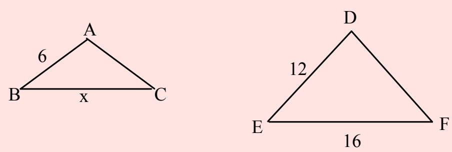
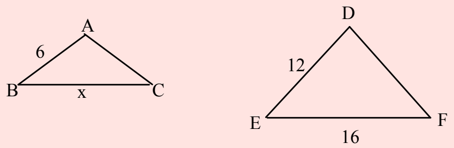
Mar 27-3:16 PM

1. Similar triangles: Two triangles that have the same________________, but not necessarily the same____________________.



Feb 17-9:07 AM

1. Similar triangles: Two triangles that have the same___SHAPE___, but not necessarily the same___SIZE___.



Feb 17-9:07 AM

2) Notation for similar:________

3) What is true about their angles?
***Corresponding angles are?_______________

4) What is true about their sides?
***Corresponding sides are ____________________

Feb 17-9:09 AM

2) Notation for similar:___~___

3) What is true about their angles?
***Corresponding angles are ___Congruent___

4) What is true about their sides?
***Corresponding sides are ___in proportion.___

Feb 17-9:09 AM

5) If two pairs of angles are congruent, what must be true about the third pair of angles? _______________

6) Therefore, we use the ________________ method to prove triangles similar.

7) Find the length of BC.

8) In a proportion the product of the ________, equals the product of the __________.

Jan 8-11:06 AM

5) If two pairs of angles are congruent, what must be true about the third pair of angles? ___congruent as well___

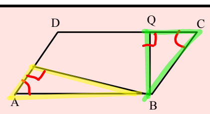
6) Therefore, we use the ___AA AA___ method to prove triangles similar.

7) Find the length of BC. $\frac{6}{X} = \frac{12}{16}$ 12x = 96, x = 8, BC = 8

8) In a proportion the product of the ___means___, equals the product of the ___extremes___.

Jan 8-11:06 AM

1) Given: Parallelogram ABCD
$\overline{BP}$ perp $\overline{AD}$
$\overline{BQ}$ perp $\overline{DC}$
Prove: ΔAPB ~ ΔCQB



Statements	Reasons
1. Parallelogram ABCD	1. given
2. <A <C	2. opp. ∠s ≅ in ▱
3. $\overline{BP}$ perp $\overline{AD}$, $\overline{BQ}$ perp $\overline{DC}$	3. given
4. <APB and <CQB are right angles	4. Defn. of ⊥
5. <APB <CQB	5. All right ∠'s ≅
6. ΔAPB ~ ΔCQB	6. AA for similarity

Feb 17-9:22 AM

Statement/Reason Proof for ~ △'s

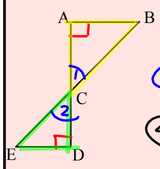
Only 1 way:

AA for similarity

Mar 27-1:42 PM

Given $\overline{AD} \perp \overline{AB}$, $\overline{AD} \perp \overline{ED}$

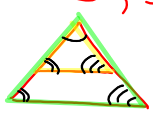
Prove: ΔABC ~ ΔDEC



Statements	Reasons
① AD ⊥ AB, AD ⊥ ED	① given
② ∢A and ∢D are right ∢'s	② ⊥ lines form right ∢'s
③ ∢1 ≅ ∢2	③ Int. lines form ≅ vertical ∢'s
④ △ABC ~ △DEC	④ AA for similarity

Feb 17-9:40 AM

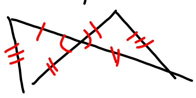
In ~ Δ's, sides are proportional



different size

Same shape

In ≅ Δ's, sides are ≅.



Same size + shape

Mar 27-1:46 PM

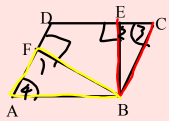
Example 2:

Given: <A ≅ <C

$\overline{BE} \perp \overline{DC}$

$\overline{BF} \perp \overline{AD}$

Prove: ΔBAF ~ ΔBCE



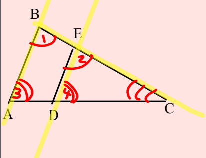
Statements	Reasons
① <A = <C	① given
② BE ⊥ DC, BF ⊥ AD	② given
③ <1 = 90°, <2 = 90°	③ perpendicular lines form right angles.
④ <1 ≅ <2	④ right angles ≅ to each other
⑤ ΔBAF ~ ΔBCE	⑤ AA

Feb 17-9:42 AM

Example #3:

Given: $\overline{AB} \parallel \overline{DE}$

Prove: ΔABC ~ ΔDEC



Statements	Reasons
1. $\overline{AB} \parallel \overline{DE}$	① given
2. ∢1 ≅ ∢2, ∢3 ≅ ∢4	2. ∥ lines ... ≅ Corresponding ∢'s
3. △ABC ~ △DEC	③ AA for similarity
4.	

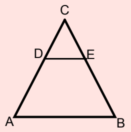
Feb 17-9:44 AM

Page 26

Mar 27-2:02 PM

1. Given: $\overline{DE} \parallel \overline{AB}$

Prove $\Delta ABC \sim \Delta DEC$



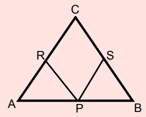
Jan 8-9:55 AM

2. Given: $\overline{AC} \cong \overline{CB}$

$\overline{PR} \perp \overline{AC}$

$\overline{PS} \perp \overline{BC}$

Prove: $\Delta APR \sim \Delta BPS$

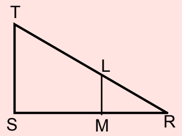


Jan 8-9:55 AM

3. Given: $\overline{TS} \perp \overline{RS}$

$\overline{LM} \perp \overline{RS}$

Prove: $\Delta LMR \sim \Delta TSR$

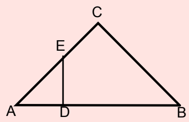


Jan 8-9:55 AM

4. Given: $BC \perp AC$

$DE \perp AB$

Prove: $\Delta ABC \sim \Delta ADE$



Jan 8-9:55 AM

Mar 23-6:28 AM

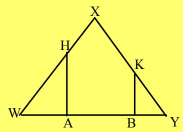
Do Now

Given: $\overline{XW} \cong \overline{XY}$

$\overline{HA} \perp \overline{WY}$

$\overline{KB} \perp \overline{WY}$

Prove: $\Delta HWA \sim \Delta KYB$



STATEMENTS	REASONS

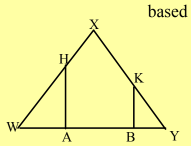
Feb 17-10:01 AM

When two triangle are similar we know that the corresponding angles are congruent.
We have just proven that the two triangles are similar by AA ≅ AA in the do now.
The second fact about similar triangles is that the corresponding sides are in proportion.
If we look at the triangle that we have just worked with, let us find some of the proportions we could use...

do not copy

Feb 24-6:59 AM

Here we can set up differernt proportions based on the congruent triangles.



ΔHWA~ΔKYB

$$\frac{WH}{WA} = \underline{\qquad}$$

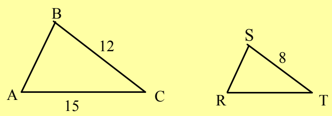
$$\frac{WH}{HA} = \underline{\qquad}$$

$$\frac{HA}{WA} = \underline{\qquad}$$

$$\frac{BY}{AH} = \underline{\qquad}$$

Feb 17-10:06 AM

Do now: In the accompanying diagram, ΔABC is similar to ΔRST. Find the length of RT.



Feb 17-10:13 AM

* Remember !! If two triangles are similar, then the corresponding sides of the two triangles are in proportion.

Once you prove that triangle 1 is similar to triangle 2, you can set up the following proportion:

$$\frac{\text{side of } \Delta\ 1}{\text{corresponding side of } \Delta 2} = \frac{\text{another side of } \Delta 1}{\text{Corresponding side of } 2}$$

Feb 17-10:14 AM

Corresponding SIDES of similar triangles are in proportion.

this is your new reason

Feb 24-7:11 AM

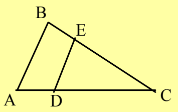
In order to prove a **proportion** you must prove that the two triangles are similar first AA≅AA.

copy and highlight

Feb 24-7:16 AM

Example 1
Given : $\overline{AB} \parallel \overline{DE}$

Prove $\frac{EC}{BC} = \frac{ED}{AB}$



Statements	Reasons

plan:
What triangles are we proving?

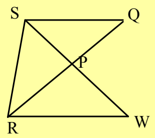
Use your pen or pencil and draw on the lines of the proportion

Feb 17-10:16 AM

Given $\overline{SR} \cong \overline{SQ}$
$\overline{RQ}$ bisects <SRW

Prove: $\frac{SQ}{RW} = \frac{SP}{PW}$

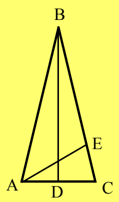
statements	reasons



Feb 17-10:22 AM

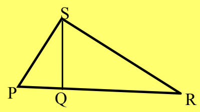
Given Isosceles triangle ABC,
$\overline{BA} \cong \overline{BC}$
$\overline{AE}$ perp $\overline{BC}$,
and $\overline{BD}$ perp $\overline{AC}$.

Prove $\frac{AC}{BA} = \frac{AE}{BD}$



Jan 9-9:44 AM

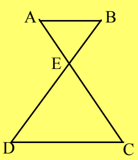
4. Given Right ΔPSR with altitude drawn to hypotenuse $\overline{PR}$
Prove $\frac{PR}{PS} = \frac{PS}{PQ}$



Jan 9-9:44 AM

5. Given: $\overline{AB} \parallel \overline{DC}$

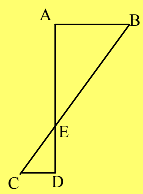
Prove: $\frac{AE}{CE} = \frac{BE}{DE}$



Jan 9-9:44 AM

6. Given: $\overline{AB} \parallel \overline{CD}$

Prove: $\frac{AE}{ED} = \frac{BE}{CE}$

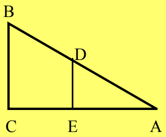


Jan 9-9:44 AM

7

In Right ΔABC, $m<C = 90$
$\overline{DE} \perp \overline{CA}$

Prove: $\frac{AD}{AB} = \frac{DE}{BC}$



Jan 9-9:44 AM

Jan 8-9:55 AM

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