3/27 Aim: Proving proportions in similar triangles

Do now: Worksheet, highlighters
have cheat sheet out
PUT homework on board

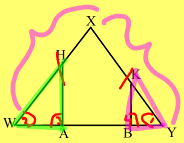
Homework: TBA

Jan 9-9:44 AM

Do Now

Given: $\overline{XW} \cong \overline{XY}$
$\overline{HA} \perp \overline{WY}$
$\overline{KB} \perp \overline{WY}$

Prove: ΔHWA ~ ΔKYB



STATEMENTS	REASONS
① $\overline{XW} \cong \overline{XY}$, $\overline{HA} \perp \overline{WY}$, $\overline{KB} \perp \overline{WY}$	① given
② ∡1 ≅ ∡2	② ∡'s across from ≅ sides are ≅
③ ∡3 is a right ∡, ∡4 is a right ∡	③ ⊥ lines form right ∡'s
④ ∡3 ≅ ∡4	④ All rt ∡s are ≅
⑤ ΔHWA ~ ΔKYB	AA

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...

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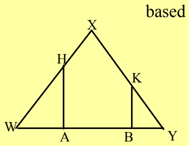
Feb 24-6:59 AM

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



ΔHWA~ΔKYB

$\frac{WH}{WA} = \frac{KY}{BY}$

$\frac{WH}{HA} = \frac{KY}{KB}$

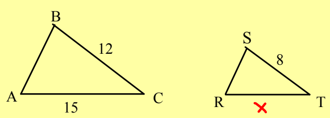
In ~Δ's corresponding sides are proportional

$\frac{HA}{WA} = \frac{KB}{BY}$

$\frac{BY}{KY} = \frac{WA}{WH}$

Feb 17-10:06 AM

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



$\frac{12}{8} = \frac{15}{x}$

$\frac{12x}{12} = \frac{120}{12}$

$x = 10$

Feb 17-10:13 AM

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* 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.

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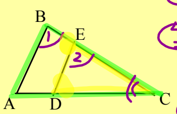
Feb 24-7:16 AM

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

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



plan:
What triangles are we proving?

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

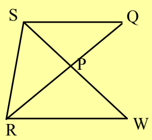
Statements	Reasons
① AB∥DE	① given
② ∡C ≅ ∡C	② reflexive
③ ∡1 ≅ ∡2	③ ∥ lines cut by a transversal have ≅ corresponding ∡'s
④ △ECD ~ △BCA	④ AA for similarity
⑤ $\frac{EC}{BC} = \frac{ED}{AB}$	⑤ Corresponding sides in ~ △'s are in proportion

Feb 17-10:16 AM

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

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

statements	reasons



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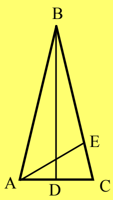
Given Isosceles triangle ABC,
$\overline{BA} \cong \overline{BC}$
$\overline{AE}$ perp $\overline{BC}$,
and $\overline{BD}$ perp $\overline{AC}$.

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



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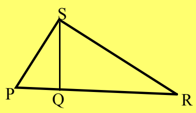
4. Given Right ΔPSR with altitude drawn to hypotenuse $\overline{PR}$
Prove $\frac{PR}{PS} = \frac{PS}{PQ}$



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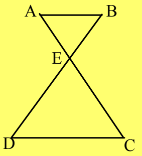
5. Given: $\overline{AB} \parallel \overline{DC}$

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



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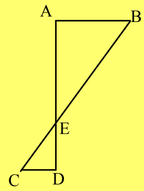
6. Given: $\overline{AB} \parallel \overline{CD}$

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



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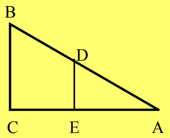
7

In Right ΔABC, m<C = 90

$\overline{DE} \perp \overline{CA}$

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



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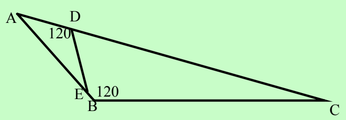
new packet

answer the do now question

Mar 30-6:37 AM

Do Now: Is triangle ABC similar to triangle ADC? Explain your answer.



Feb 8-6:49 AM

** To prove that the product of the lengths of two line segments is equal to the products of the lengths of two other line segments:

1. First, prove that two triangles are **similar**.

2. Next, form a **proportion** that includes the lengths of the four line segments, based on corresponding sides of the similar triangles.

3. Then apply the theorem: **In a proportion, the product of the means equals the product of the extremes**

Jan 12-6:37 AM

$$\frac{AB}{CD} = \frac{EF}{GH}$$

can be written as

AB:CD = EF:GH

means

extremes

Jan 12-6:46 AM

Sometimes you will have to set up the proportion first to then determine the triangles.

Jan 12-6:46 AM

Let's look at example #1

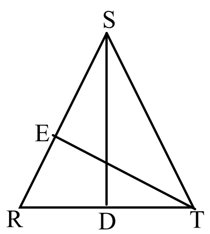
When you want to solve a proportion what do you do?

Jan 12-6:46 AM

So when we look at example 1 we need to set up the proportion that reflects our cross multiplication

Mar 30-6:58 AM

ER x SD = TE x DT



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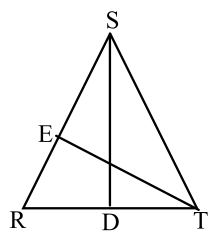
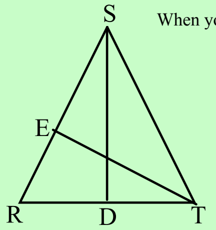
ER x SD = TE x DT



Mar 30-6:49 AM

Let's look at example #1

ER x SD = TE x DT



When you want to solve a proportion what do you do?

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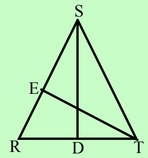
example 1:
Given: Isosceles triangle RST with SR = ST, <TER and <SDT are right angles.
Prove: ER x SD = TE x DT



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*****NOTE*****
The order of the last three lines will always be the same!!!!!!

AA ≅ AA (triangles similar)

Corresponding sides of similar triangles are in proportion. (the proportion)

In a proportion, the product of the means is equal to the product of the extremes. (the product)

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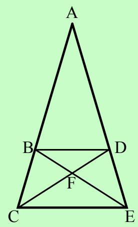
3. Given: <EBC ≅ <CDE
Prove: FB:FD = FC:FE



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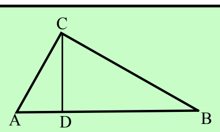
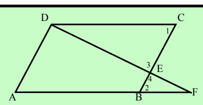
4. Given: ΔABC, <ACB is a right angle, and CD ⊥ AB
Prove: AC x BD = CD x BC



1. <ACB is a right angle, CD ⊥ AB
2. <B ≅<B
3. <CDB is a right angle
4. <CDB ≅ <ACB
5. ΔABC ~ ΔCBD
6. $\frac{AC}{CD} = \frac{BC}{BD}$
7. AC x BD = CD x BC

Jan 12-7:03 AM

5. If ABCD is a parallelogram, prove:
a) ΔCED ~ ΔBEF
b) $\frac{CE}{DE} = \frac{BE}{FE}$
c) DE x BE = FE x CE



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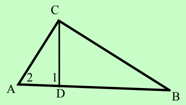

In right triangle ABC, <ACB is a right angle and CD ⊥ AB.
Prove:
a) ΔBCA ~ ΔCDA
b) AD x CB = DC x AC

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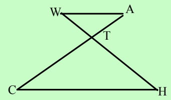
7. Given: WA || CH
WH and AC intersect at point T.

Prove that (WT)(CT) = (HT)(AT).



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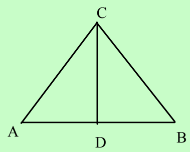
8. Given: In right triangle ABC,
m<C = 90
CD ⊥ AB

Prove: AB:AC = AC:AD



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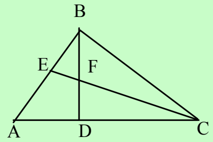
9. Given: Acute ΔABC with altitudes $\overline{BD}$ and $\overline{CE}$ intersecting at F.
Prove: BD x AC = AB x CE



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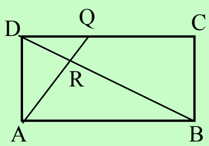
10. Given: Rectangle ABCD and $\overline{AQ}$ perpendicular to diagonal to $\overline{BD}$ at R.
Prove: CD x DA = DB x AR



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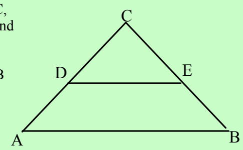
11. Given: In triangle ABC,
D is the midpoint of AC and
E is the midpoint of BC

Prove: CD : CA = DE : AB



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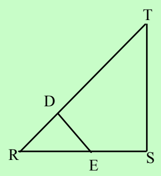
12. Given: <S is a right angle
DE ⊥ RT
Prove: DR x TS = ED x SR

(I changed diagram)



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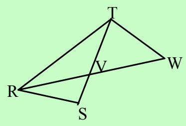
13. Given: V is a point on ST such that RVW bisects < SRT and TW≅ TV.
Prove: RW x SV = RV x TW



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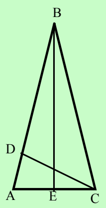
14. Given: Isosceles triangle ABC, $\overline{BA} \cong \overline{BC}$,
Altitudes $\overline{BE}$ and $\overline{CD}$ are drawn, $\overline{BDA}$ and $\overline{CEA}$

Prove BC x DA = CA x EC



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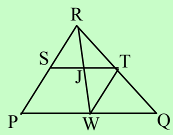
Given: $\overline{RP}$ || $\overline{TW}$
Prove: RS x TJ = TW x SJ



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Mar 30-6:41 AM