

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	STATEMENTS	REASONS
Given: $\overline{XW} \cong \overline{XY}$ $\overline{HA} \perp \overline{WY}$ $\overline{KB} \perp \overline{WY}$ Prove: $\triangle HWA \sim \triangle KYB$		

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 $AA \cong AA$ 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.

<p>$\triangle HWA \sim \triangle KYB$</p>	$\frac{WH}{WA} = \underline{\hspace{2cm}}$ $\frac{WH}{HA} = \underline{\hspace{2cm}}$ $\frac{HA}{WA} = \underline{\hspace{2cm}}$ $\frac{BY}{KY} = \underline{\hspace{2cm}}$
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Feb 17-10:06 AM

Do now: In the accompanying diagram, $\triangle ABC$ is similar to $\triangle RST$. 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.

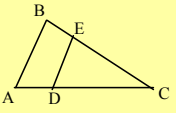
this is your new reason

Feb 24-7:11 AM

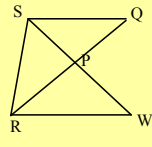
In order to prove a **proportion** you must prove that the two triangles are similar first $AA \cong AA$.

copy

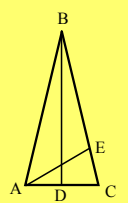
Feb 24-7:16 AM

<p>Example 1 Given : $\overline{AB} \parallel \overline{DE}$</p> <p>Prove $\frac{EC}{BC} = \frac{ED}{AB}$</p>  <p>plan: What triangles are we proving?</p> <p>Use your pen or pencil and draw on the lines of the proportion</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 50%;">Statements</th> <th style="width: 50%;">Reasons</th> </tr> <tr> <td style="height: 150px;"> </td> <td> </td> </tr> </table>	Statements	Reasons			<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 50%;">statements</th> <th style="width: 50%;">reasons</th> </tr> <tr> <td style="height: 150px;"> </td> <td> </td> </tr> </table>	statements	reasons		
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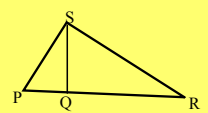
Feb 17-10:16 AM

<p>Given $\overline{SR} \cong \overline{SQ}$ RQ bisects $\angle SRW$</p> <p>Prove: $\frac{SQ}{RW} = \frac{SP}{PW}$</p> 	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 50%;">statements</th> <th style="width: 50%;">reasons</th> </tr> <tr> <td style="height: 150px;"> </td> <td> </td> </tr> </table>	statements	reasons			<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 50%;">statements</th> <th style="width: 50%;">reasons</th> </tr> <tr> <td style="height: 150px;"> </td> <td> </td> </tr> </table>	statements	reasons		
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Feb 17-10:22 AM

<p>Given Isosceles triangle ABC, $\overline{BA} \cong \overline{BC}$ $\overline{AE} \perp \overline{BC}$, and $\overline{BD} \perp \overline{AC}$.</p> <p>Prove $\frac{AC}{BA} = \frac{AE}{BD}$</p> 	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 50%;">Statements</th> <th style="width: 50%;">Reasons</th> </tr> <tr> <td style="height: 150px;"> </td> <td> </td> </tr> </table>	Statements	Reasons			<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 50%;">statements</th> <th style="width: 50%;">reasons</th> </tr> <tr> <td style="height: 150px;"> </td> <td> </td> </tr> </table>	statements	reasons		
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Jan 9-9:44 AM

<p>4. Given Right $\triangle PSR$ with altitude drawn to hypotenuse \overline{PR}</p> <p>Prove $\frac{PR}{PS} = \frac{PS}{PQ}$</p> 	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 50%;">Statements</th> <th style="width: 50%;">Reasons</th> </tr> <tr> <td style="height: 150px;"> </td> <td> </td> </tr> </table>	Statements	Reasons			<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 50%;">statements</th> <th style="width: 50%;">reasons</th> </tr> <tr> <td style="height: 150px;"> </td> <td> </td> </tr> </table>	statements	reasons		
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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 $\triangle ABC$, $m\angle C = 90^\circ$
 $\overline{DE} \perp \overline{CA}$
 Prove: $\frac{AD}{AB} = \frac{DE}{BC}$

Jan 9-9:44 AM

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

1) AA
 2) Corresponding sides of similar triangles are in proportion
 3) In a proportion, the product of the means is equal to the product of the extremes.

Apr 10-11:26 AM

$\frac{AB}{CD} = \frac{EF}{GH}$
 can be written as
 $AB:CD = EF:GH$
 $\frac{AB}{CD} = \frac{EF}{GH}$
 means
 extremes

Jan 12-6:46 AM

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

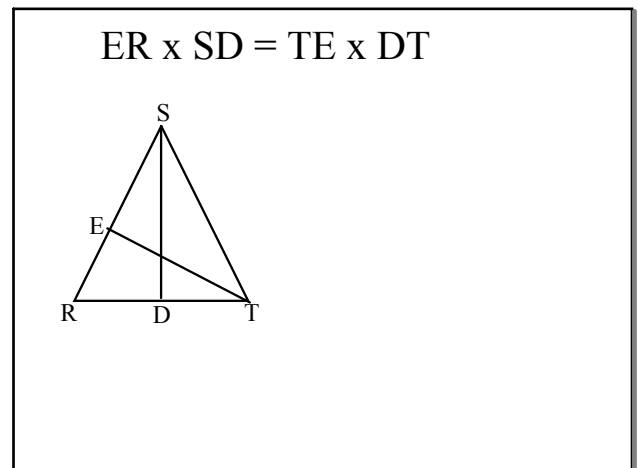
Jan 12-6:46 AM

Let's look at example #1
 When you want to solve a proportion what do you do?

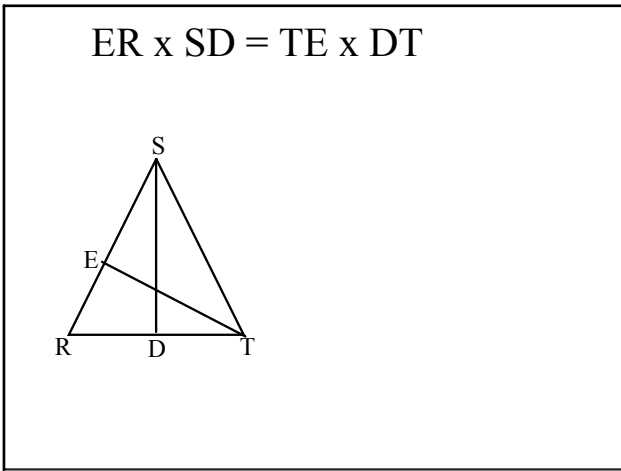
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So when we look at example 1 we need to set up the proportion that reflects our cross multiplication

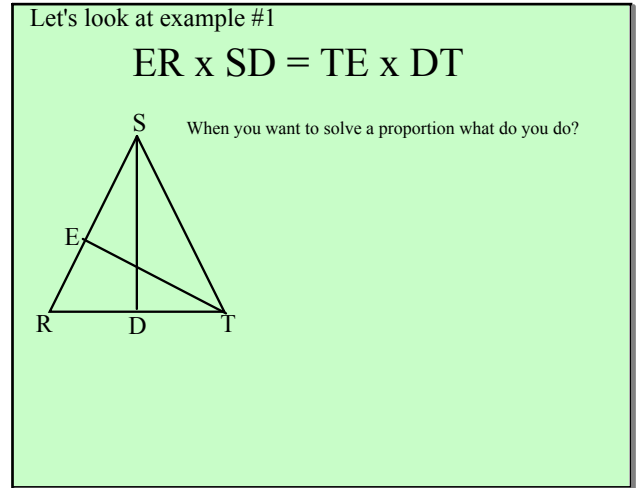
Mar 30-6:58 AM



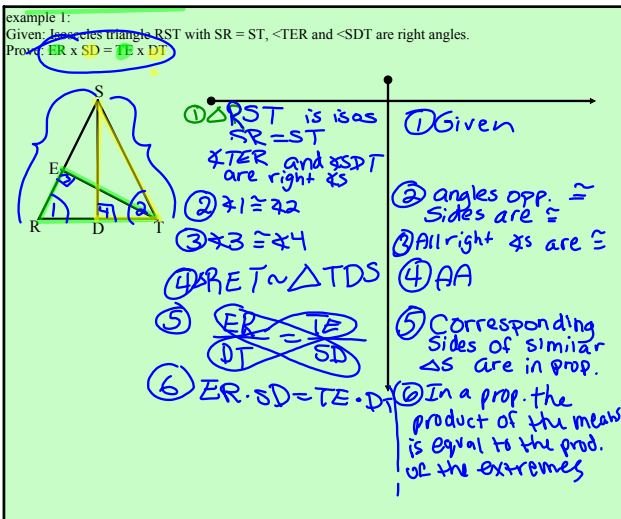
Mar 30-6:49 AM



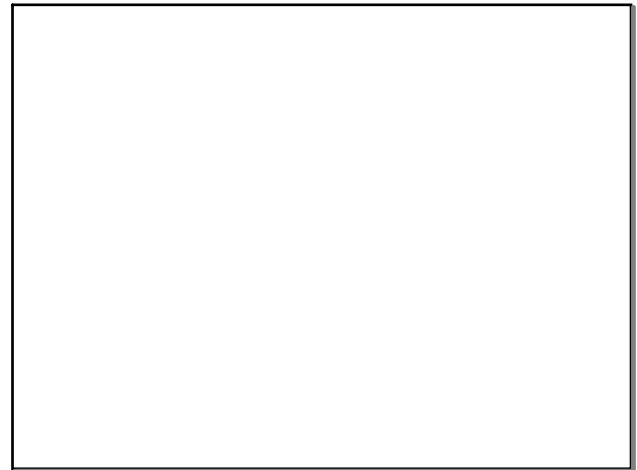
Mar 30-6:49 AM



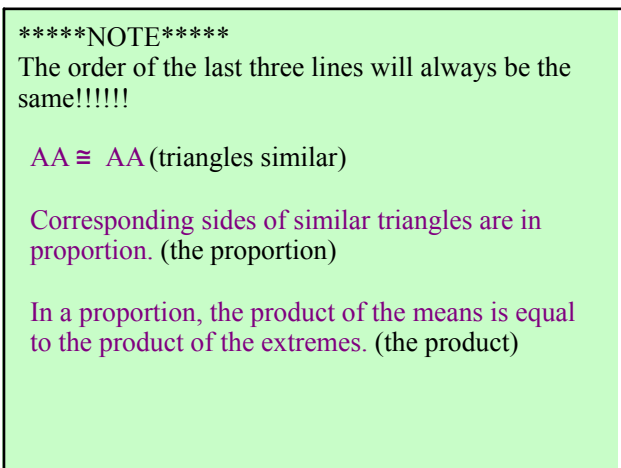
Jan 12-6:46 AM



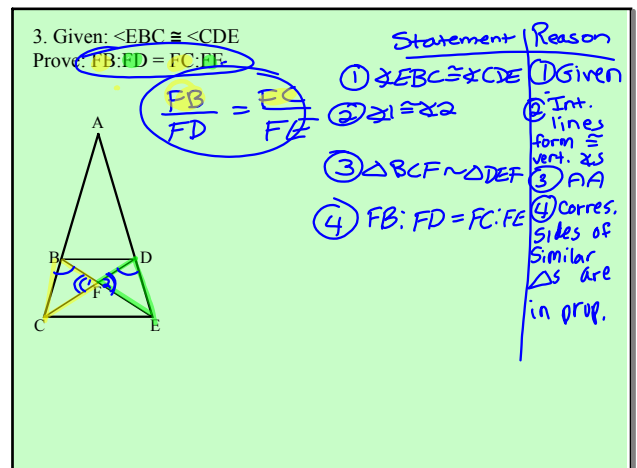
Feb 8-6:59 AM



Apr 10-11:40 AM

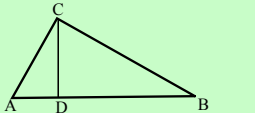


Jan 12-6:53 AM



Feb 8-6:59 AM

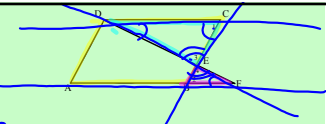
4. Given: $\triangle ABC$, $\angle ACB$ is a right angle, and $CD \perp AB$
 Prove: $AC \times BD = CD \times BC$



1. $\angle ACB$ is a right angle, $CD \perp AB$
2. $\angle B \cong \angle B$
3. $\angle CDB$ is a right angle
4. $\angle CDB \cong \angle ACB$
5. $\triangle ABC \sim \triangle CBD$
6. $\frac{AC}{CD} = \frac{BC}{BD}$
7. $AC \times BD = CD \times BC$

Jan 12-7:03 AM

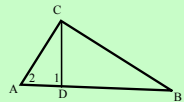
5. If ABCD is a parallelogram, prove:
 a) $\triangle CED \sim \triangle BEF$
 b) $\frac{CE}{DE} = \frac{BE}{FE}$
 c) $DE \times BE = FE \times CE$



Statement	Reason
① ABCD is a \square	① Given
② $\angle 1 \cong \angle 2$	② Parallel lines cut by a transversal form \cong alt. interior \angle s
③ $\angle 3 \cong \angle 4$	③ Intersecting lines form \cong vertical \angle s
④ $\triangle CED \sim \triangle BEF$	④ AA
⑤ $\frac{CE}{DE} = \frac{BE}{FE}$	⑤ Corres. sides of $\sim \triangle$ s are in prop.
⑥ $DE \times BE = CE \times FE$	⑥ In a prop. the prod. of the means is equal to the prod. of the extremes.

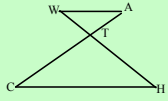
Feb 8-7:06 AM

In right triangle ABC, $\angle ACB$ is a right angle and $CD \perp AB$.
 Prove:
 a) $\triangle BCA \sim \triangle CDA$
 b) $AD \times CB = DC \times AC$



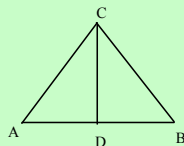
Jan 12-7:24 AM

7. Given: $WA \parallel CH$
 WH and AC intersect at point T.
 Prove that $(WT)(CT) = (HT)(AT)$.



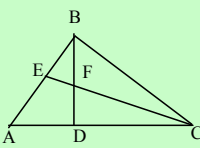
Jan 12-7:24 AM

8. Given: In right triangle ABC,
 $m\angle C = 90$
 $CD \perp AB$
 Prove: $AB:AC = AC:AD$



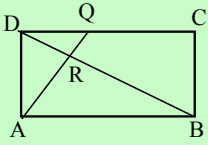
Jan 12-7:24 AM

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



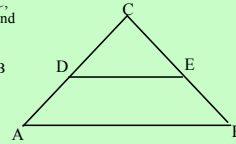
Jan 12-7:24 AM

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



Jan 12-7:24 AM

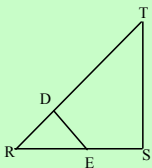
11. Given: In triangle ABC,
 D is the midpoint of AC and
 E is the midpoint of BC
 Prove: $CD : CA = DE : AB$



Jan 12-7:24 AM

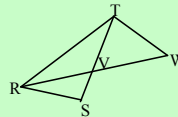
12. Given: $\angle S$ is a right angle
 $DE \perp RT$
 Prove: $DR \times TS = ED \times SR$

(I changed diagram)



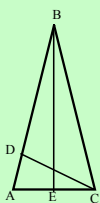
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13. Given: V is a point on ST such that RVW bisects $\angle SRT$ and $TW \cong TV$.
 Prove: $RW \times SV = RV \times TW$



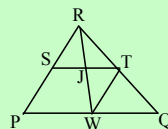
Jan 12-7:43 AM

14. Given: Isosceles triangle ABC, $\overline{BA} \cong \overline{BC}$.
 Altitudes \overline{BE} and \overline{CD} are drawn, \overline{BD} and \overline{CE}
 Prove $BC \times DA = CA \times EC$

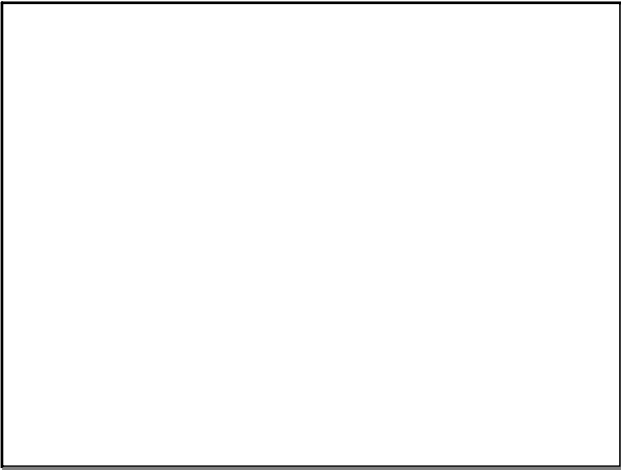


Jan 12-7:43 AM

Given: $RP \parallel TW$
 Prove: $RS \times TJ = TW \times SJ$



Jan 12-7:44 AM



Mar 30-6:41 AM