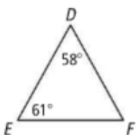
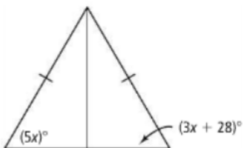


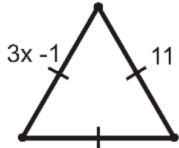
Bell Ringer

Section 10.5 – Isosceles and Equilateral Triangles

- Is $\overline{DE} \cong \overline{DF}$? Explain.



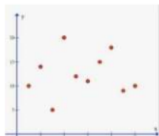

- Find the value of x .


- Find the value of x .



4. Isosceles triangle XYZ has base XY and $m\angle Y = 34^\circ$. What is the $m\angle Z$?

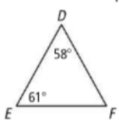
5. Describe the correlation of each scatter plot.

Solutions

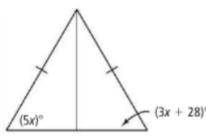
Section 10.5 – Isosceles and Equilateral Triangles

1. Is $\overline{DE} \cong \overline{DF}$? Explain.



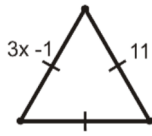
Yes, $m\angle F = 61^\circ$ so $\overline{DE} \cong \overline{DF}$ by the Converse of the Isosceles Triangle Theorem

2. Find the value of x.



$x = 14$

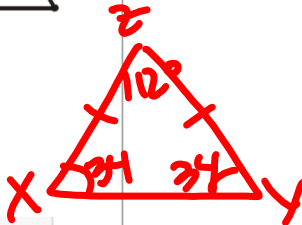
3. Find the value of x.




$x = 4$

4. Isosceles triangle XYZ has base XY and $m\angle Y = 34^\circ$. What is the $m\angle Z$?


$m\angle Z = 112^\circ$




5. Describe the correlation of each scatter plot.



Negative



Positive



No Correlation

10.5 #s 1-18 due tomorrow

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10-6 Congruence in Right Triangles

G.SRT.5 Use congruence . . . criteria . . . to solve problems and to prove relationships in geometric figures.
Also **G.CO.10**

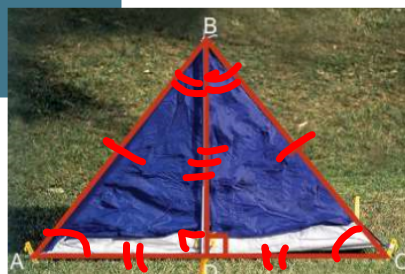
p567



Solve It: Getting Ready!

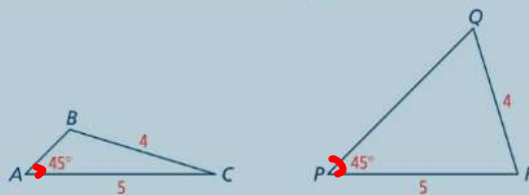


One of the tent flaps was damaged in a storm. Can you use the other flap as a pattern to replace it? Explain.



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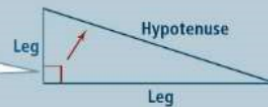
In the diagram below, two sides and a nonincluded angle of one triangle are congruent to two sides and the nonincluded angle of another triangle.



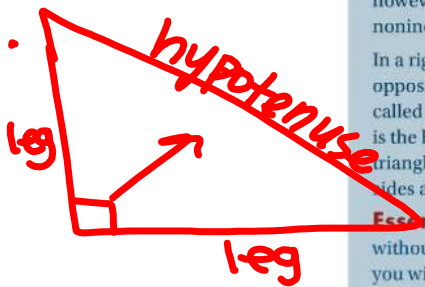
Notice that the triangles are not congruent. So, you can conclude that Side-Side-Angle is *not* a valid method for proving two triangles congruent. This method, however, works in the special case of right triangles, where the right angles are the nonincluded angles.

In a right triangle, the side opposite the right angle is called the **hypotenuse**. It is the longest side in the triangle. The other two sides are called **legs**.

The right angle always "points" to the hypotenuse.



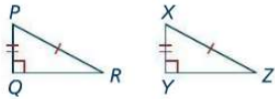
Essential Understanding You can prove that two triangles are congruent without having to show that *all* corresponding parts are congruent. In this lesson, you will prove right triangles congruent by using one pair of right angles, a pair of hypotenuses, and a pair of legs.



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take note **Theorem 6 Hypotenuse-Leg (HL) Theorem**

| Theorem | If ... | Then ... |
|--|--|-------------------------------------|
| If the hypotenuse and a leg of one right triangle are congruent to the hypotenuse and a leg of another right triangle, then the triangles are congruent. | $\triangle PQR$ and $\triangle XYZ$ are right \triangle , $\overline{PR} \cong \overline{XZ}$, and $\overline{PQ} \cong \overline{XY}$ | $\triangle PQR \cong \triangle XYZ$ |
| |  | |

take note **Key Concept Conditions for HL Theorem**

To use the HL Theorem, the triangles must meet three conditions.

Conditions

- There are two right triangles.
- The triangles have congruent hypotenuses.
- There is one pair of congruent legs.

not in book

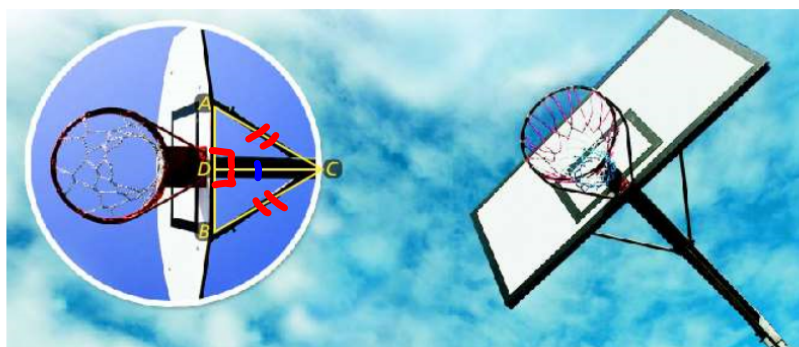
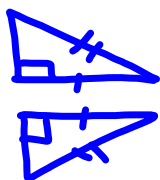


Problem 1

Using the HL Theorem



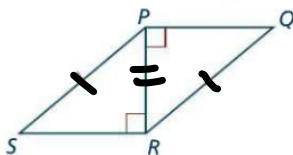
On the basketball backboard brackets shown, $\angle ADC$ and $\angle BDC$ are right angles and $\overline{AC} \cong \overline{BC}$. Are $\triangle ADC$ and $\triangle BDC$ congruent?



Got it pg 569

Got It? a. **Given:** $\angle PRS$ and $\angle RPQ$ are right angles, $\overline{SP} \cong \overline{QR}$

Prove: $\triangle PRS \cong \triangle RPQ$



Statement
 $\angle PRS$ & $\angle RPQ$
 are right \angle s
 $\triangle PRS$ & $\triangle RPQ$ are right \triangle s
 $\overline{SP} \cong \overline{QR}$
 $\overline{PR} \cong \overline{PR}$
 $\triangle PRS \cong \triangle RPQ$

Reason
 Given
 Defn of right \triangle
 Given
 Reflexive
 HL

b. Reasoning Your friend says, "Suppose you have two right triangles with congruent hypotenuses and one pair of congruent legs. It does not matter which leg in the first triangle is congruent to which leg in the second triangle. The triangles will be congruent." Is your friend correct? Explain.

Yeah!

p569



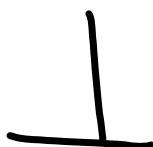
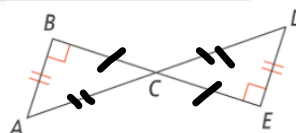
not in book



Problem 2

Writing a Proof Using the HL Theorem

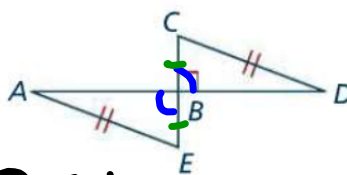
Proof **Given:** \overline{BE} bisects \overline{AD} at C .
 $\overline{AB} \perp \overline{BC}$, $\overline{DE} \perp \overline{EC}$, $\overline{AB} \cong \overline{DE}$
Prove: $\triangle ABC \cong \triangle DEC$



Got it pg 570

Got It? Given: $\overline{CD} \cong \overline{EA}$, \overline{AD} is the perpendicular bisector of \overline{CE}

Prove: $\triangle CBD \cong \triangle EBA$



Statement

$$\overline{CD} \cong \overline{EA}$$

AD is perp. bis. of \overline{CE}

$$\angle CBD \cong \angle EBA, = 90^\circ$$

$\triangle CBD$ & $\triangle EBA$ are rt \triangle s

$$\overline{CB} \cong \overline{EB}$$

$$\triangle CBD \cong \triangle EBA$$

Reason

Given

Given

Vertical Angles, Def'n of \perp bisect

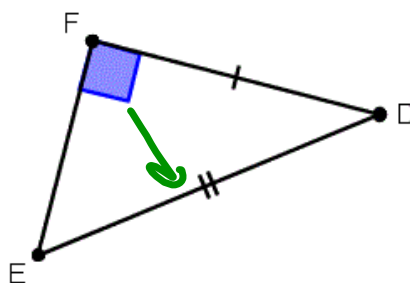
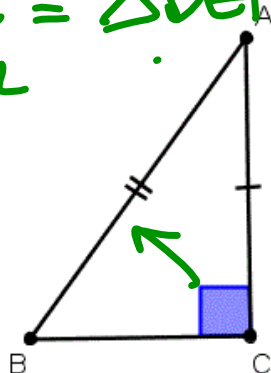
Definition of bisect

HL

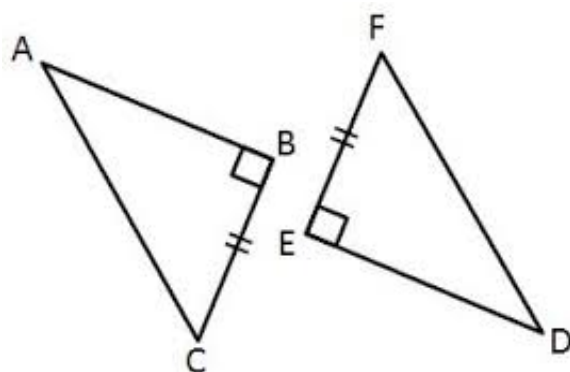
p570

Are the triangles congruent?
Congruence statement:

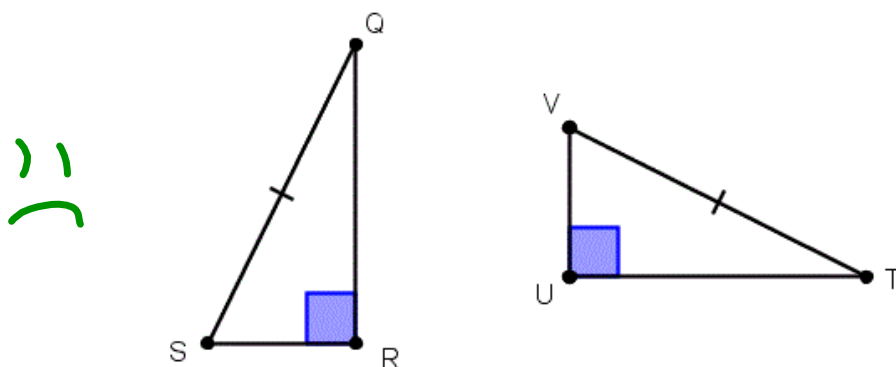
$\triangle ABC \cong \triangle DEF$
by HL



Are the triangles congruent?
Congruence statement:



Are the triangles congruent?
Congruence statement:

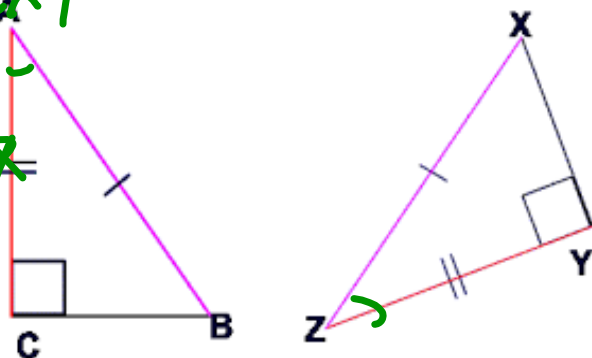


Are the triangles congruent?

Congruence statement:

$$\triangle ABC \cong \triangle XYZ$$

$$\triangle ACB \cong \triangle XYZ$$



10.6 #s 2, 5-9, 11-13