Day 1: Angle Relationships and Vocab

∠1 and ∠2 are complementary angles. ∠2 and ∠3 are supplementary angles. Given the measures of ∠1 below, find m∠2 and m∠3.

1. m∠1 = 80°

m∠2 = _____

m∠3 = _____

2. m∠1 = 33°

m∠2 = _____

m∠3 = _____

3. m∠1 = 72°

m∠2 = _____

m∠3 = _____

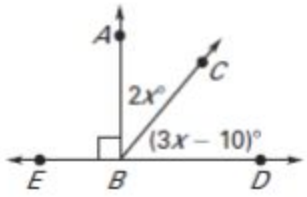
4. m∠1 = 7°

m∠2 = _____

m∠3 = _____

Find the value of x. Then, find m∠ABC and m∠CBD.

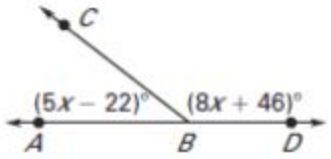
5.



x = _____

m∠ABC= _____ ° m∠CBD = _____°

6.

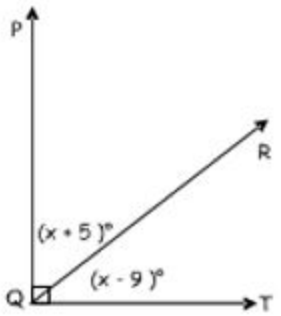


x = _____

m∠ABC= _____° m∠CBD = _____°

Write an equation to find each value of x. Then, find the measure of each angle.

7.



Equation: _____

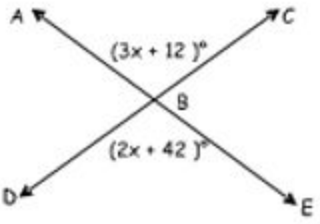
x = _____

m∠PQR = _____ °

m∠RQT = _____°

*What relationship do these two angles have to each other?

8.



Equation: _____

x = _____

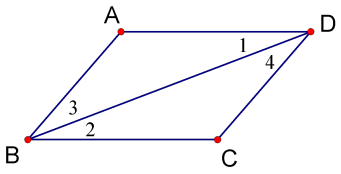
m∠ABC = _____°

m∠ABD = _____°

What relationship do these two angles have to each other?

Day 2: Transversals and Parallel Lines

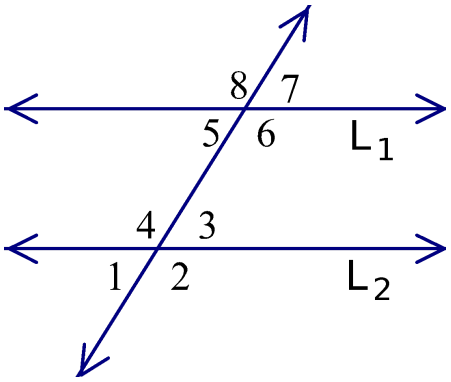
I. Use Figure ABCD.



1. Name the three lines that make:
   - $\angle 3$ and $\angle 4$ alternate interior angles
   - $\angle 1$ and $\angle 2$ alternate interior angles

2. Are there any *corresponding* angles that can be identified by the points and segments illustrated in the diagram?

II. Given: $L_1 \parallel L_2$



1. $m\angle 3$ = 2x + 40
   $m\angle 7$ = 3x + 20
   Find $m\angle 3$.

2. $m\angle 5$ = x
   $m\angle 3$ = 4x + 21
   Find $m\angle 7$.

3. $m\angle 5$ = 4x – 10
   $m\angle 4$ = 2x – 20
   Find $m\angle 6$ *and* $m\angle 8$.

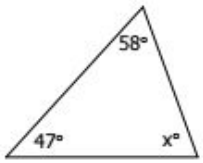
4. $m\angle 4$ = 3x + 40
   $m\angle 7$ = 2x
   Find $m\angle 1$.

5. $m\angle 4$ = 3x + 40
   $m\angle 7$ = 2x
   Find $m\angle 1$.

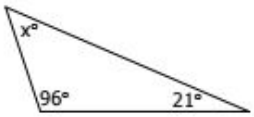
Day 3: Triangle Sum Theorem and Isosceles Triangle Theorem (ITT)

I. Find the value of "x".

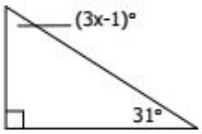
1) x = _____



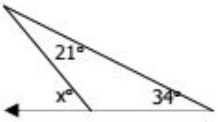
2) x = _____



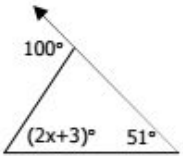
3) x = _____



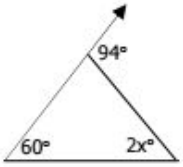
4) x = _____



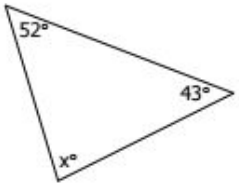
5) x = _____



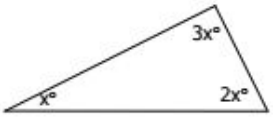
6) x = _____



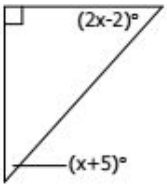
7) x = _____



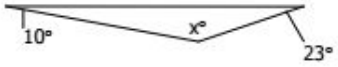
8) x = _____



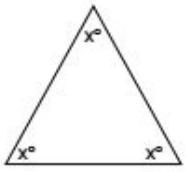
9) x = _____



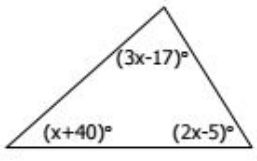
10) x = _____



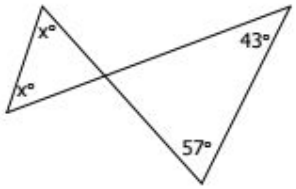
11) x = _____



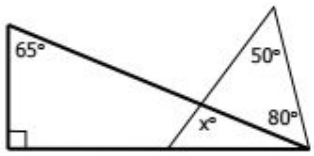
12) x = _____



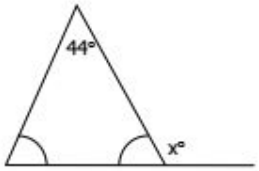
13) x = _____



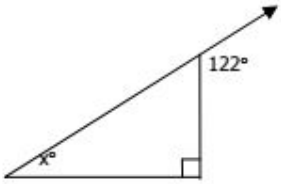
14) x = _____



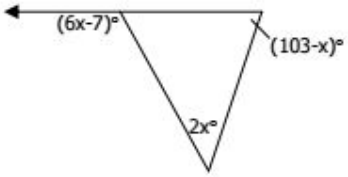
15) x = _____



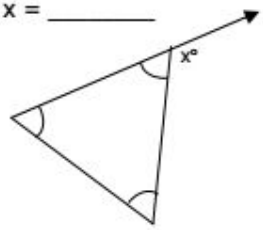
16) x = _____



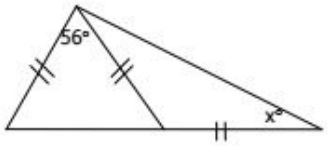
17) x = _____



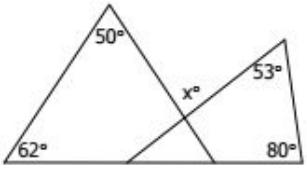
18) x = _____



19) x = _____

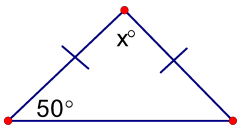


20) x = _____



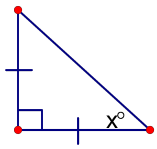
Find the value of the variable or question mark using the Isosceles Triangle Theorem

1.



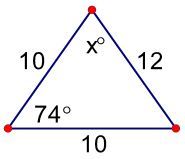
x = _____

2.



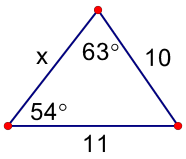
x = _____

3.



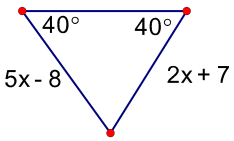
x = _____

4.



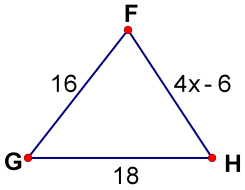
x = _____

5.



x = _____

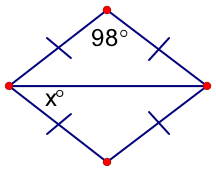
6.



$\angle F \cong \angle G$

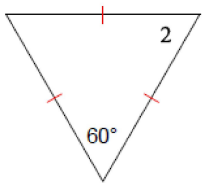
x = _____

7.



x = _____

8. $m\angle 2 = 7x + 4$

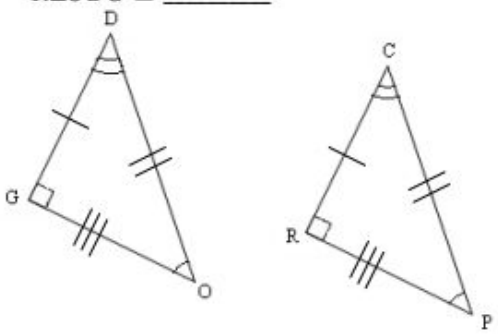


x = _____

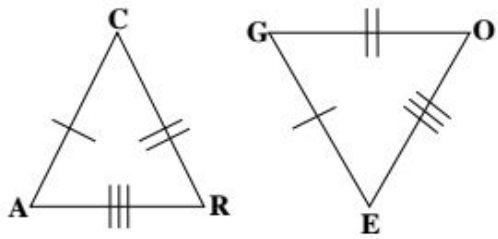
Day 5: CPCTC

I. Name the congruent triangles.

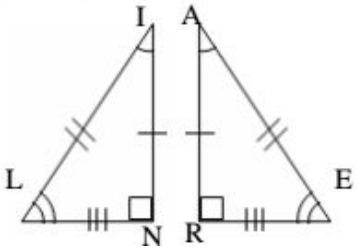
1. $\Delta ODG \cong$ _____



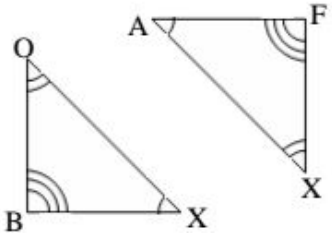
2. $\Delta CAR \cong$ _____



3. $\Delta LIN \cong$ _____

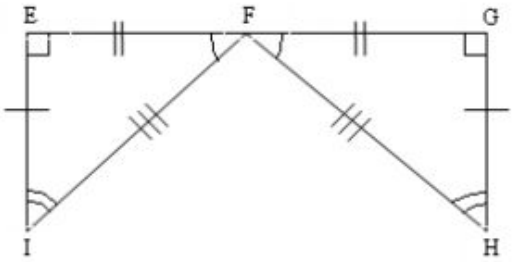


4. $\Delta BOX \cong$ _____



II. Name the congruent triangle and the congruent parts..

7.



$\Delta FEI \cong$ _____

$\angle EFI \cong$ _____ $\overline{FG} \cong$ _____

$\angle G \cong$ _____ $\overline{GH} \cong$ _____

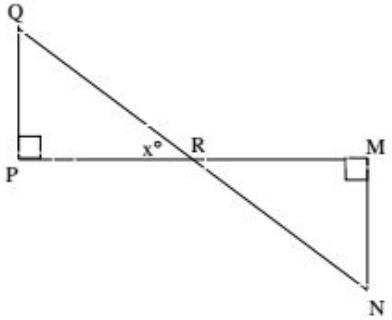
$\angle H \cong$ _____ $\overline{FH} \cong$ _____

Use the congruency statement to fill in the corresponding congruent parts.

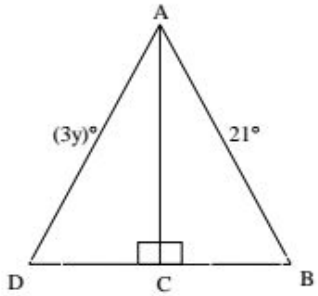
8. $\Delta LAP \cong \Delta HOT$ $\angle APL \cong$ _____ $\overline{LP} \cong$ _____ $\angle PAL \cong$ _____

$\angle PLA \cong$ _____ $\overline{AP} \cong$ _____ $\overline{AL} \cong$ _____

9. $\Delta PQR \cong \Delta MNR$. Find x.



10. $\Delta ABC \cong \Delta ADC$ Find y.



III. $\Delta PQR \cong \Delta ABC$. Find the values of x and y.

1. $m\angle R = 5x + 70, m\angle C = 24x - 25, QR = 4y + 2, BC = x + y$

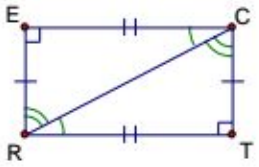
2. $PQ = 5x - 31, QR = -3y - 1, BC = x + 1, AB = 9 - y$

3. $m\angle A = 15y - 3, m\angle P = 43 - x, PQ = 11 - x, AB = 3y + 1$

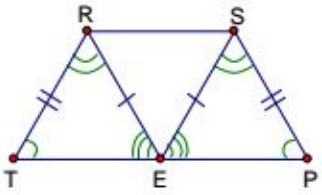
4. $\Delta XYZ \cong \Delta MNO, m\angle X = x + 10, m\angle M = y + 20, m\angle Y = 3x$, and $m\angle N = x + 3y$. Find $m\angle X$ and $m\angle Y$.

IV. Indicate which triangles are congruent. Be sure to have the correspondence of the letters correct.

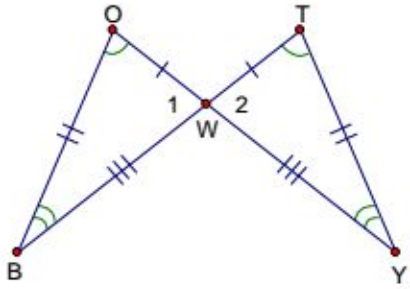
a. $\Delta ERC \cong$ _____
Why is $\overline{RC} \cong \overline{RC}$?



b. E is the midpoint of $\overline{TP}$
$\Delta SPE \cong$ _____



c. $\Delta BOW \cong$ _____
Why is $\angle 1 \cong \angle 2$?



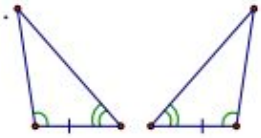
V. Solve.

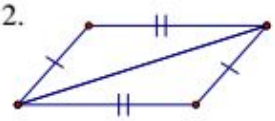
1. Given: $\Delta NEW \cong \Delta CAR$
EN = 11
AR = 2x – 4y
NW = x + y
CA = 4x + y
EW = 10

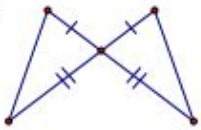
Draw the triangles, solve for x and y, and find CR.

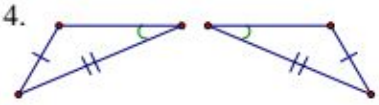
Day 6: Congruence Postulates

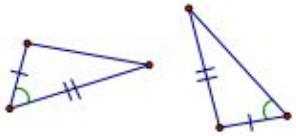
I. If the triangles can be proven congruent, give the reason (SSS, SAS, ASA, or AAS). If there is not enough information to prove the triangles congruent, write "none."

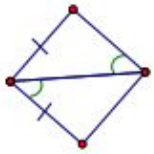
1. 

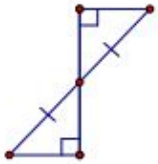
2. 

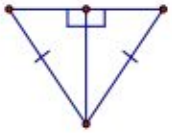
3. 

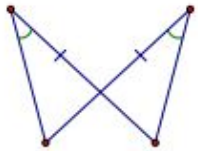
4. 

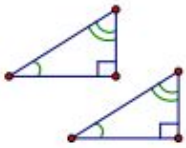
5. 

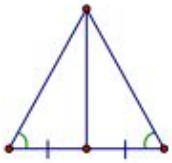
6. 

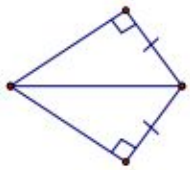
7. 

8. 

9. 

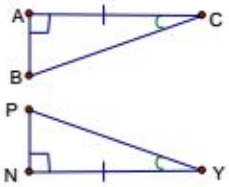
10. 

11. 

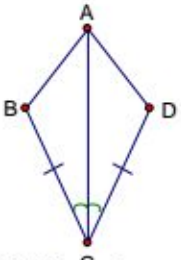
12. 

II. Determine whether you can conclude that another triangle is congruent to ΔABC.

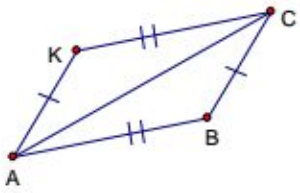
- If so, complete the congruence statement and give the reason (SSS, SAS, ASA, or AAS).
- If not, write "none."

1. 

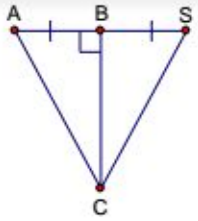
$\Delta ABC \cong \Delta$_____
by _____

2. 

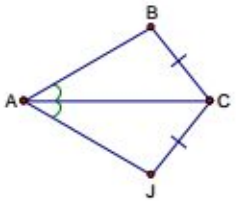
$\Delta ABC \cong \Delta$_____
by _____

3. 

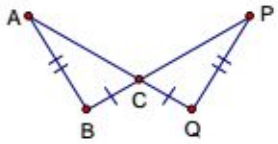
$\Delta ABC \cong \Delta$_____
by _____

4. 

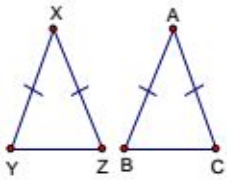
$\Delta ABC \cong \Delta$_____
by _____

6. 

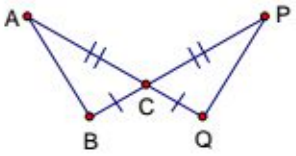
$\Delta ABC \cong \Delta$_____
by _____

8. 

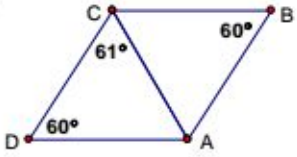
$\Delta ABC \cong \Delta$_____
by _____

5. 

$\Delta ABC \cong \Delta$_____
by _____

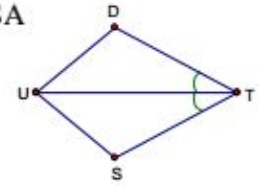
7. 

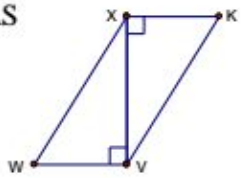
$\Delta ABC \cong \Delta$_____
by _____

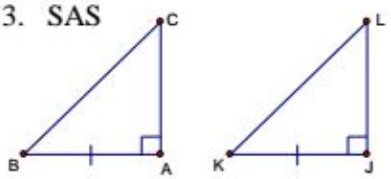
9. 

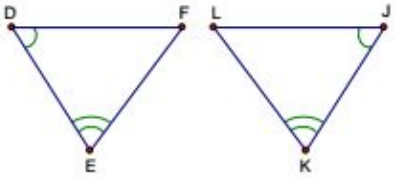
$\Delta ABC \cong \Delta$_____
by _____

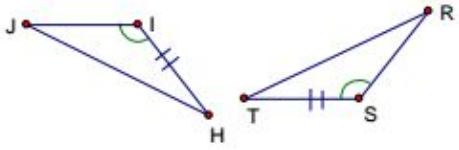
What additional information is required in order to know that the triangles are congruent by the given reason?

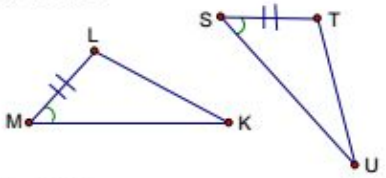
1. ASA 

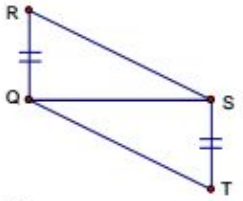
2. SAS 

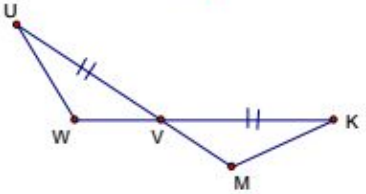
3. SAS 

4. ASA 

5. SAS 

6. ASA 

7. SSS 

8. SAS 

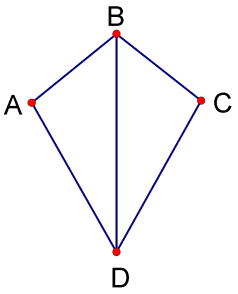
Day 7: Congruence Proofs

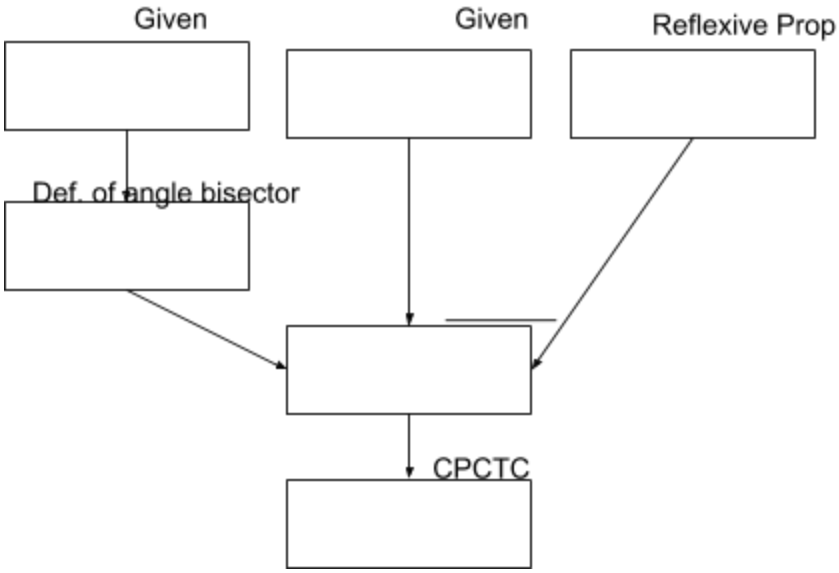
Complete the following congruence proofs:

1. Given: $\overline{BD}$ bisects $\angle ABC$

   $\overline{BA} \cong \overline{CB}$

   Prove: ◺ADB ≅ ◺BDC $\Delta ABD \cong \Delta CBD$

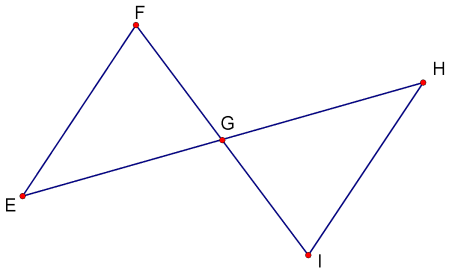


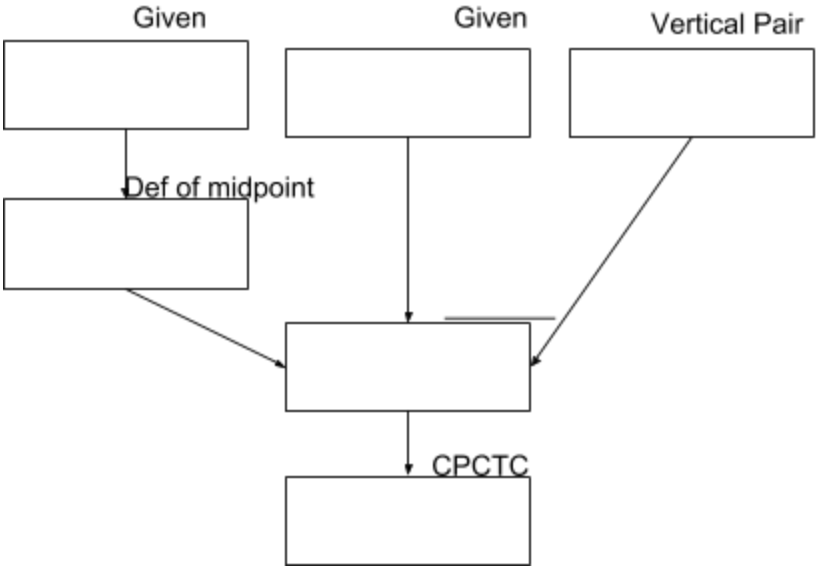


2. Given: G *is the midpoint of* $\overline{FI}$

   ◺F ≅ ◺I

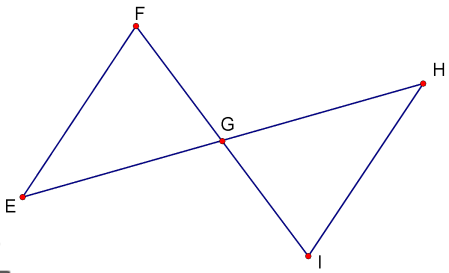
   Prove: $\overline{EF} \cong \overline{IH}$



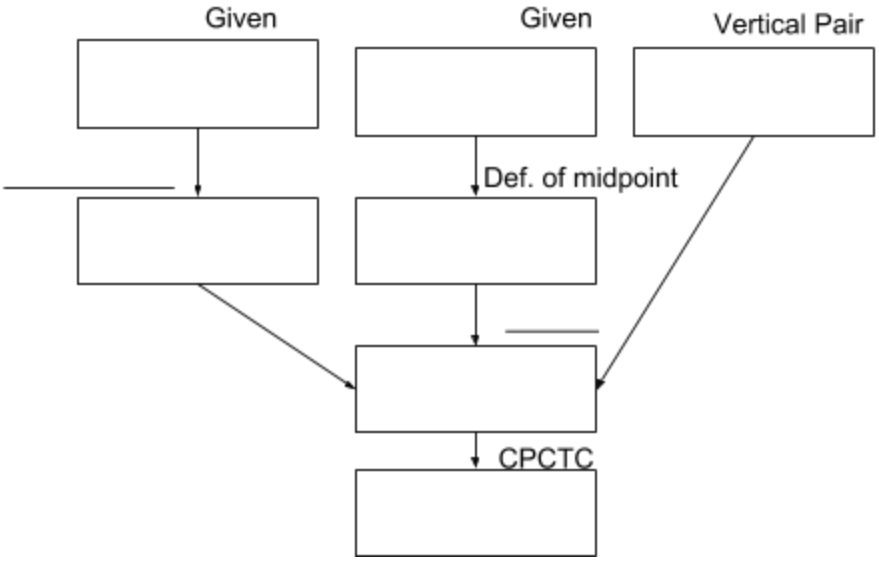


3. Given: $\overline{EF} // \overline{HI}$

   G is the midpoint of $\overline{EH}$



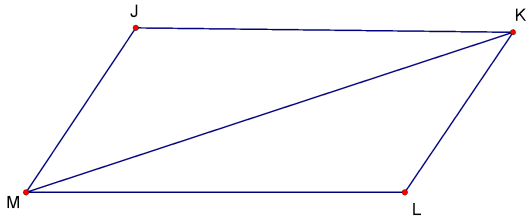
Prove: $\overline{FG} \cong \overline{GH}$



4. Given: $\overline{JM} // \overline{LK}$

   $\measuredangle J \cong \measuredangle L$

   Prove: $\overline{JK} \cong \overline{ML}$

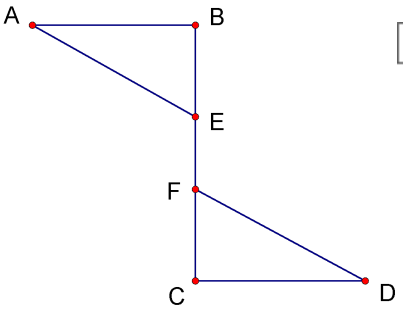


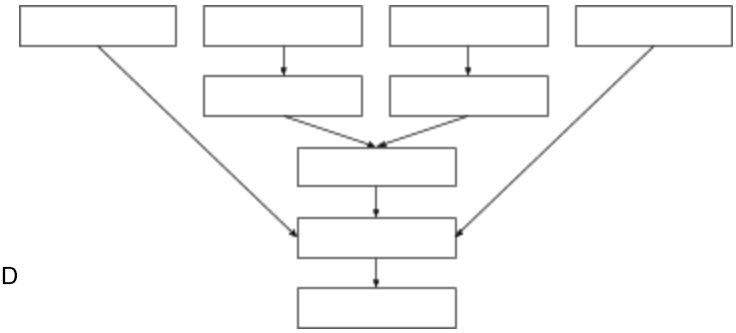
Day 8: Congruence Proofs

Complete these proofs on a **separate sheet** of paper. A small guideline of the flowcharts are provided.

1. Given: $\overline{AB} \cong \overline{CD}$
   $\overline{AB} \perp \overline{BC}$
   $\overline{CD} \perp \overline{BC}$
   $\overline{AE} \cong \overline{CD}$

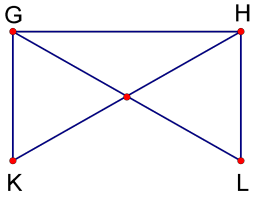
   Prove: ∡A ≅ ∡D

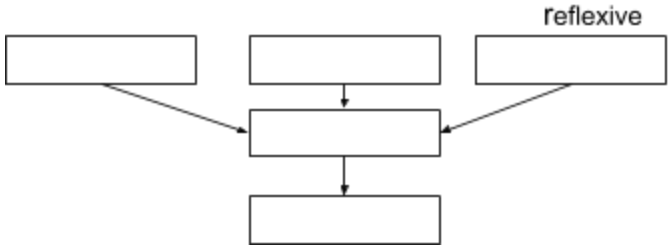




2. Given: $\overline{GK} \cong \overline{HL}$
   $\overline{GL} \cong \overline{HK}$

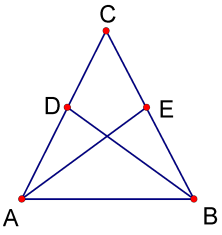
   Prove: ∡K ≅ ∡L

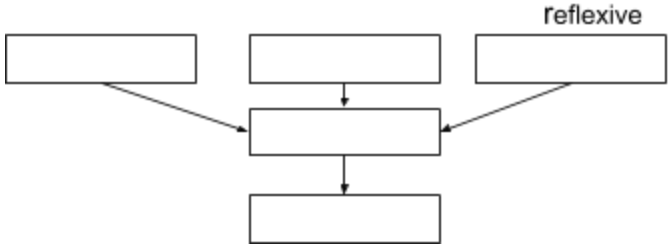




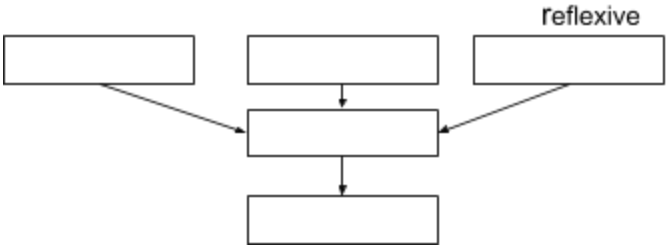
3. Given: $\overline{AC} \cong \overline{BC}$
   $\overline{AE} \cong \overline{BD}$

   Prove: $\overline{CD} \cong \overline{CE}$





4. Given: <F and <H are right angles
   G is the midpoint of $\overline{FH}$
   $\overline{EG} \cong \overline{LG}$

   Prove: ∡E ≅ ∡L

   **HINT: Think about which shortcut applies to right triangles!