Theorems about Lines and Angles
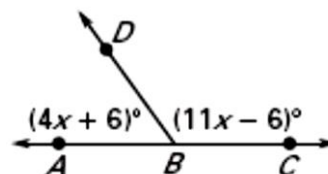
1. Name the relationship and then find the missing angle measures by solving for x.
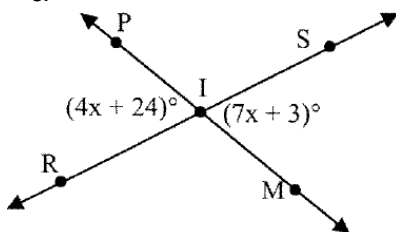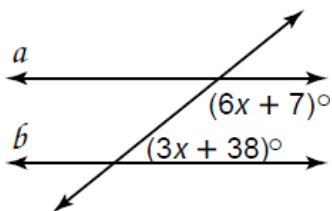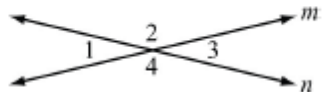
a.
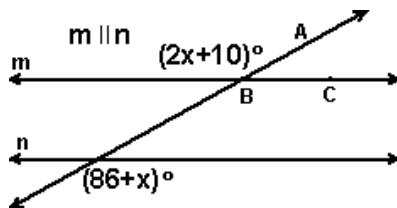
b.

c.

d.

2. The measure of one angle is 38 more than three times its supplement. Find the measure of each angle.

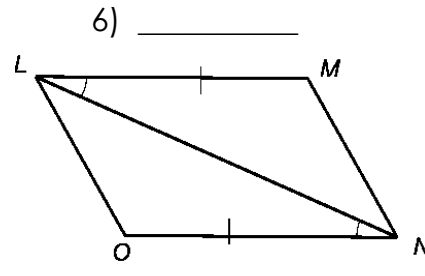3. Determine what steps are missing from the following proofs.

Prove: $\angle 1 \cong \angle 3$

| Statement	Justification
1. $m\angle 1 + m\angle 2 = 180$	1.
2. $m\angle 2 + m\angle\_\_\_\_ = 180$	2.
3. $m\angle\_\_\_\_ + m\angle 3 = m\angle 1 + m\angle 2$	3. Substitution
4. $m\angle\_\_\_\_ = m\angle 3$	4.
5.	5. Definition of congruent angles

Congruent Triangles

Determine whether each pair of triangles is congruent. If so, write a congruence statement, and explain why the triangles are congruent.
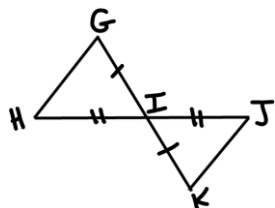
4) _____

5) _____

6) _____

_____   _____   _____
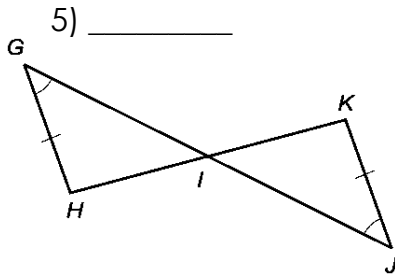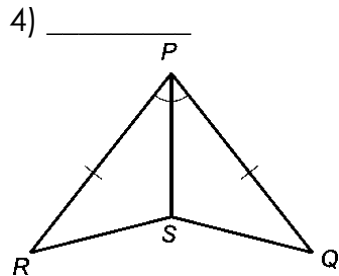
7) For ΔABC and ΔDEF the following is given: $\angle A \cong \angle D, \angle B \cong \angle E, \overline{AB} \cong \overline{DE}$. Sketch a picture to determine if the two triangles can be proven congruent. If so, create a two column proof.

8. Complete the following proofs.
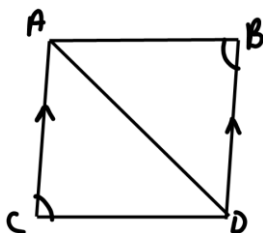
Statement	Reason
1. $\overline{AC} \parallel \overline{DB}$	1.
2.	2. Given
3. $\angle CAD \cong \angle BDA$	3.
4.	4. Reflexive Property
5. $\triangle ACD \cong \triangle$ _____	5.

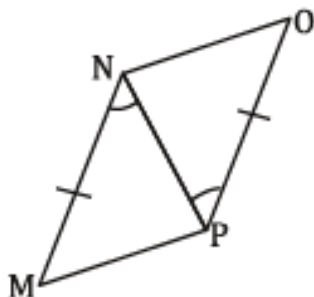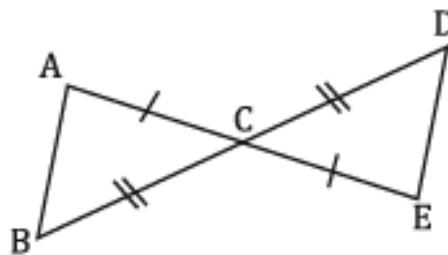| Statement	Reason
1. $\overline{GI} \cong \overline{KI}$	1.
2. $\overline{HI} \cong \overline{JI}$	2.
3. $\angle GIH \cong \angle KIJ$	3.
4. $\triangle GIH \cong \triangle KIJ$	4.

CPCTC: _____

9. Complete the following proofs.

Given: ∠MNP≅∠OPN, and $\overline{MN}≅\overline{OP}$

Prove: $\overline{MP}≅\overline{NO}$

Statements	Reasons
1.	1. Given
2. $\overline{MN}≅\overline{OP}$	2.
3. $\overline{NP}≅\overline{NP}$	3.
4. ΔMNP≅ΔOPN	4.
5.	5. CPCTC

Given: $\overline{AC}≅\overline{CE}$, $\overline{DC}≅\overline{BC}$

Prove: ∠B≅∠D

Statements	Reasons
1.	1.
2.	2. Given
3. ∠ACB≅∠DCE	3.
4. ΔABC≅ΔDEF	4.
5. ∠B≅∠D	5.

Dilations
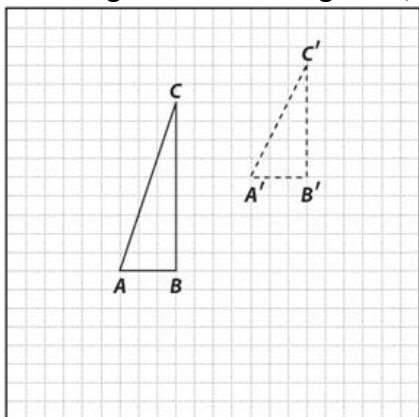
10. Dilate the figure with a scale factor of ½ and the center at the (0,0). Then list the location of the dilated points.
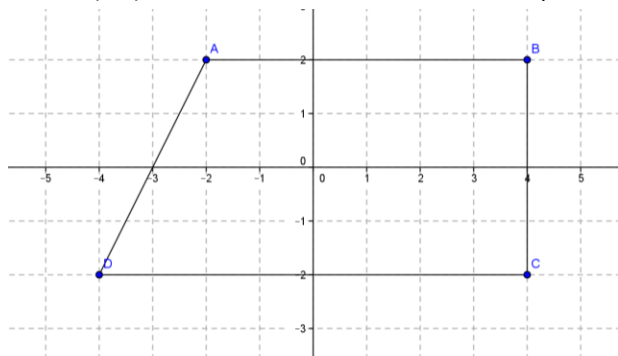
11. Write the coordinates of the vertices after a dilation with a scale factor of 3, centered at the origin.
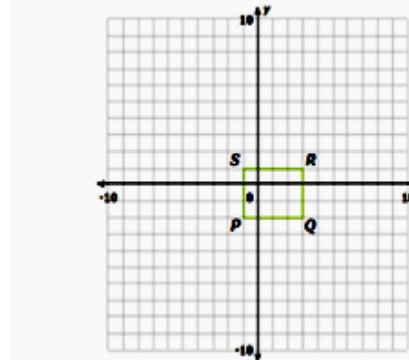

12. Are the two figures below congruent, similar, or neither?

a. Similar, ΔABC has undergone a vertical stretch

b. Congruent, ΔABC has undergone a vertical and horizontal shift.

c. Similar, ΔABC has undergone a vertical compression

d. Not congruent nor similar, ΔABC has undergone a vertical compression
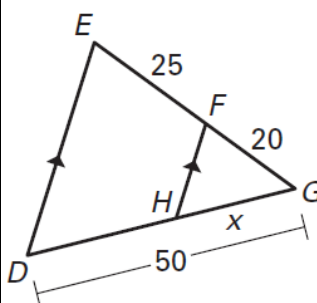
Similar Triangles

13. The following shapes are similar. Find the scale factor, the measure of each side, and the measure of each angle if possible.
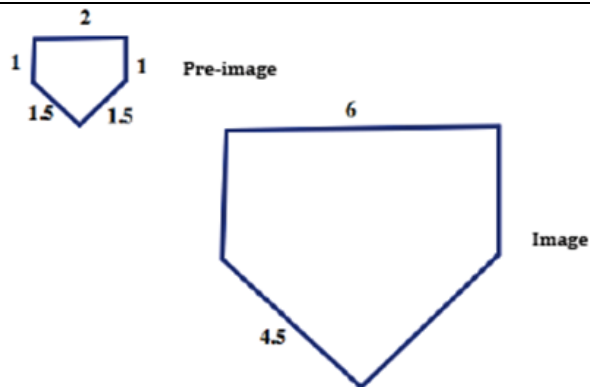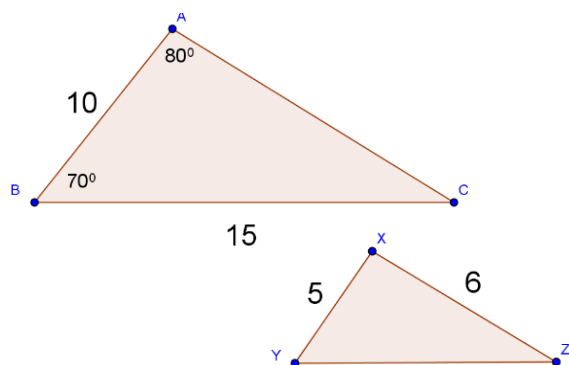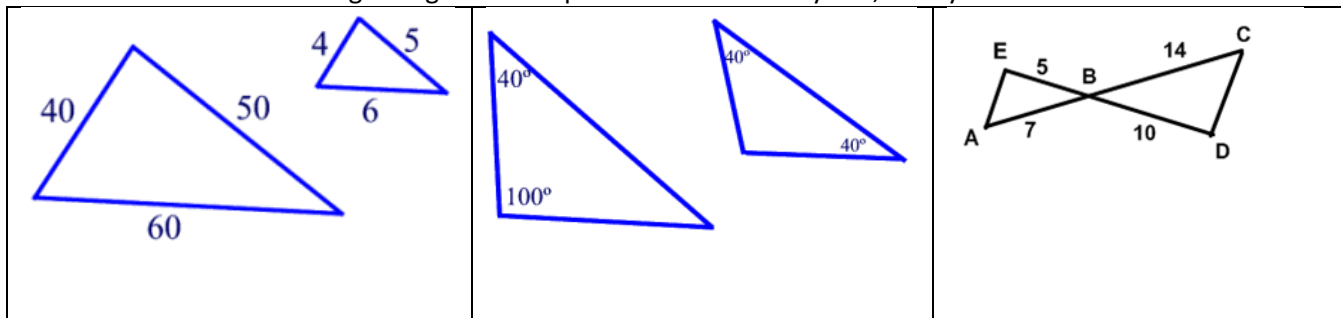

14. In the following diagram, $AC \parallel DE$. Find the length of side BE.
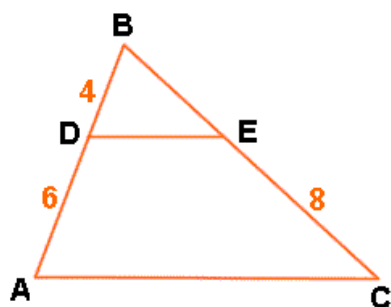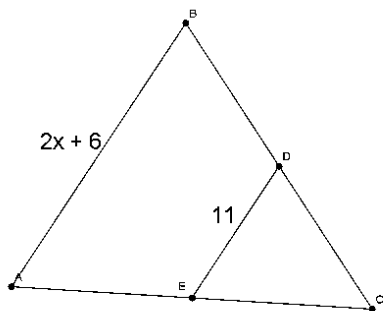

15. Find the length of HG.

16. Determine if the following triangles can be proven similar. If they can, tell by which theorem.

Triangle Midsegment Theorem

17. In the diagram to the right, line $\overline{DE}$ is a midsegment. Find the value of x.

Properties of Parallelograms

18. $\Delta VWT \cong \Delta TUV$. Find the value of x.