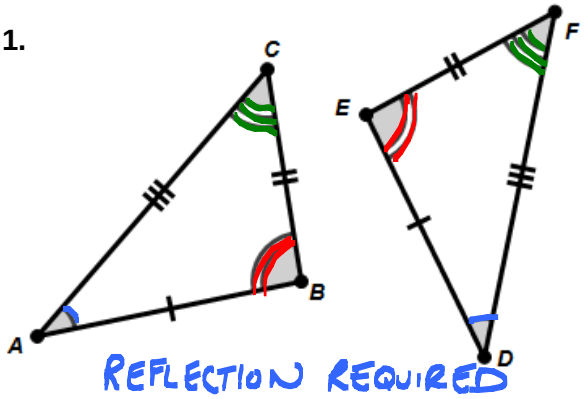
Sec 1.7 Geometry – Congruence

Name:

Any two congruent figures can be mapped onto one another using a series of rigid or isometric transformation (reflections, rotations, and translations). ***– See GSP Lab (Transformations) –***

Each of the following pairs of figures shown below are congruent. Write a congruence statement for each and tell whether or not a reflection would be needed to map the pre-image onto the image.

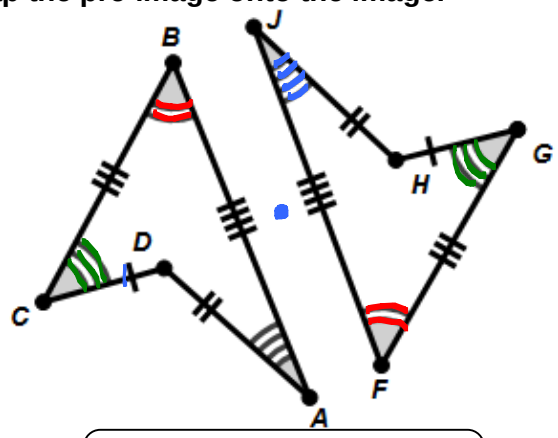
1.



REFLECTION REQUIRED

$\triangle ABC \cong \triangle DEF$

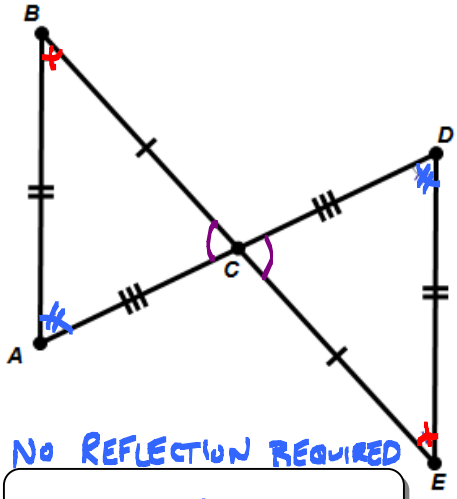
2.



$\square ABCD \cong \square JFGH$

NO REFLECTION REQUIRED

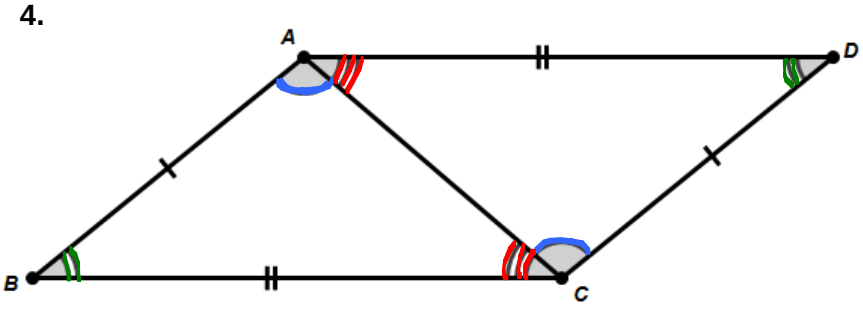
3.



NO REFLECTION REQUIRED

$\triangle ABC \cong \triangle DEC$

4.



NO REFLECTION REQUIRED

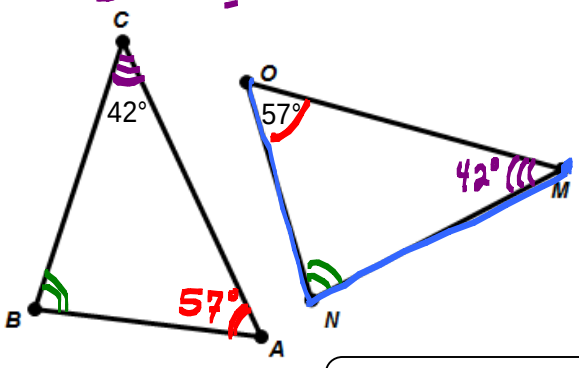
$\triangle ABC \cong \triangle CDA$

Given the following congruencies find the requested unknown angle.

5. $\triangle ABC \cong \triangle QNM$

180-57-42

81



$m\angle N = 180 - 57 - 42$

$= 81°$

$m\angle MNO = 81°$

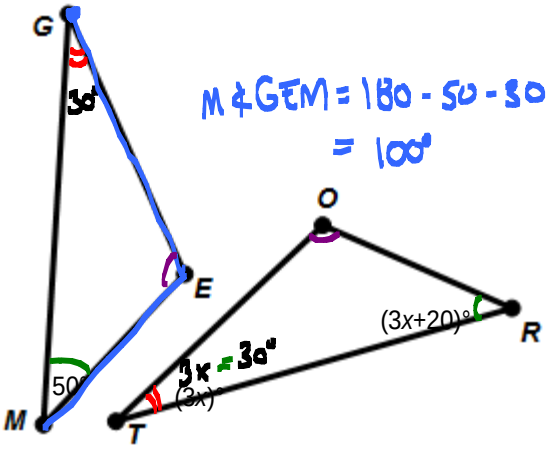
6. $\triangle GEM \cong \triangle TOR$

$3x + 20 = 50$

$-20 \quad -20$

$\frac{3x}{3} = \frac{30}{3}$

$x = 10$



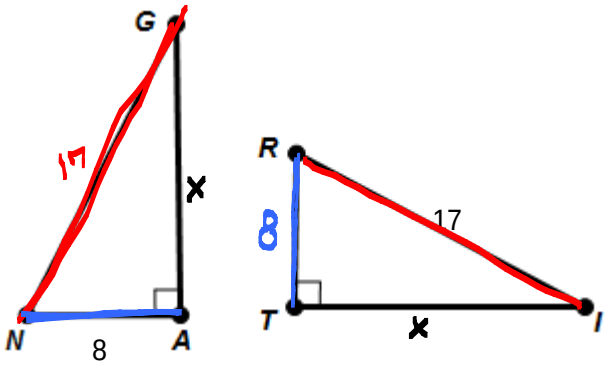
$m\angle GEM = 180 - 50 - 30$

$= 100°$

$m\angle GEM = 100°$

Given the following congruencies find the requested unknown side.

7. $\triangle TRI \cong \triangle ANG$



$8^2 + x^2 = 17^2$

$64 + x^2 = 289$

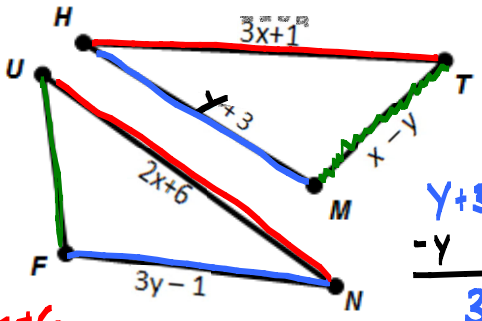
$-64 \quad -64$

$\sqrt{x^2} = \sqrt{225}$

$x = 15$

$GN = 17$

8. $\Delta MTH \cong \Delta FUN$



$3x+1 = 2x+6$

$-2x \quad -2x$

$x+1 = 6$

$-1 \quad -1$

$x = 5$

$y+3 = 3y-1$

$-y \quad -y$

$3 = 2y-1$

$+1 \quad +1$

$\frac{4}{2} = \frac{2y}{2}$

$2 = y$

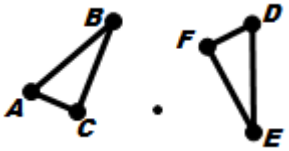
$MT = x - y$

$= 5 - 2 = 3$

$UF = 3$

The following pairs of triangles are congruent. Provide a suggested transformation or series of transformations that can map one triangle onto the other congruent triangle. ***(In each diagram*** $\Delta ABC \cong \Delta DEF$ ***)***

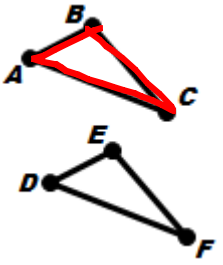
9.



Circle which transformation(s) could be used to map ΔABC onto ΔDEF.

Translation	Reflection
Rotation	Dilation

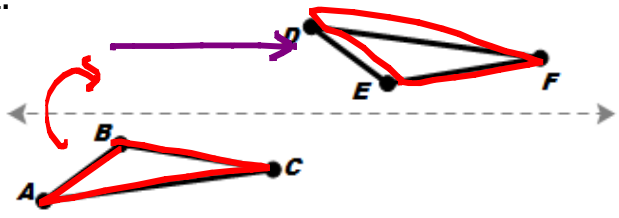
10.



Circle which transformation(s) could be used to map ΔABC onto ΔDEF.

Translation	Reflection
Rotation	Dilation

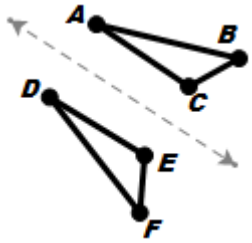
11.



Circle which transformation(s) could be used to map ΔABC onto ΔDEF.

Translation	Reflection
Rotation	Dilation

12.



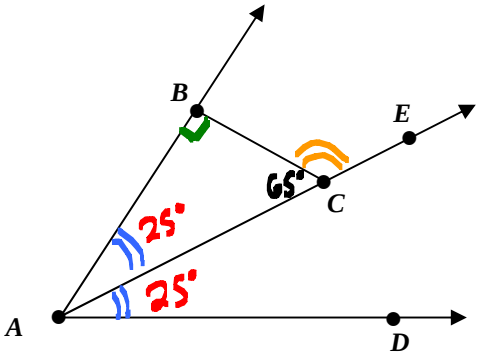
Circle which transformation(s) could be used to map ΔABC onto ΔDEF.

Translation	Reflection
Rotation	Dilation

Angle Puzzles. (angles are not drawn to scale)

9. Find $m\measuredangle BCE$

Given:
- $\overrightarrow{AC}$ bisects $\measuredangle DAB$
- $m\measuredangle DAB = 50°$
- $\measuredangle ABC$ is a right angle



1) $m\measuredangle BAC = \frac{50}{2} = 25$

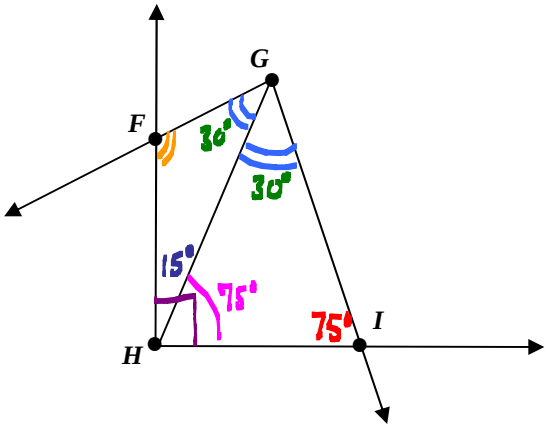
2) $m\measuredangle ACB = 180 - 25 - 90$
$= 65°$

3) $m\measuredangle BCE = 180 - 65°$
$= 115°$

$m\measuredangle BCE = 115°$

10. Find $m\measuredangle GFH$

Given:
- $\overline{GH}$ bisects $\measuredangle FGI$
- $m\measuredangle FGI = 60°$
- $m\measuredangle GIH = 75°$
- $\measuredangle FHI$ is a right angle



1) $m\measuredangle HGI = \frac{60}{2} = 30°$

2) $m\measuredangle GHI = 180 - 30 - 75 = 75°$

3) $m\measuredangle GHF = 90 - 75 = 15°$

4) $m\measuredangle GFH = 180 - 30 - 15 = 135°$

$m\measuredangle GFH = 135°$