

Objective: Understand what rigid motion is and determine whether a transformation is a rigid motion or not.

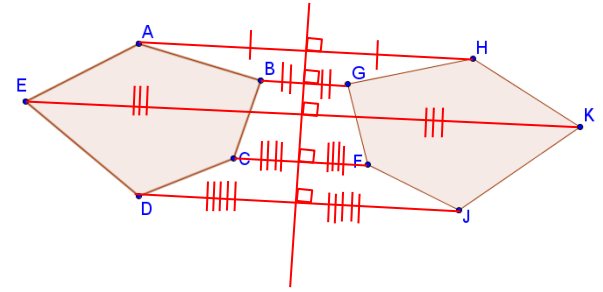
Definition: Rigid Motion is a transformation that 1. Preserves distances
 2. Preserves angle measurements

Definition: Congruent – **Objects which are the result of a rigid motion transformation**
 * Same shape, same size, same angles, same distances

Given $ABCDE \cong HGFJK$:

(a) What rigid motion or motions maps ABCDE to HGFJK?

Reflection



(b) What statements can we make as a result of the congruence?

$\angle A \cong \angle H, \angle B \cong \angle G, \angle C \cong \angle F, \angle D \cong \angle J, \angle E \cong \angle K$

$\overline{AB} \cong \overline{HG}, \overline{BC} \cong \overline{GF}, \overline{CD} \cong \overline{FJ}, \overline{DE} \cong \overline{JK}, \overline{EA} \cong \overline{KH}$

Objective: Understand if polygons are congruent, how their corresponding parts match up and use that knowledge to solve for missing information.

<p>Key Ideas/Summary: There are two ways to prove that polygons are congruent:</p> <p>(a) Illustrate the rigid motion that maps one to the other</p> <p>(b) Measure ALL sides and \angle's & compare. Find corr parts that are \cong</p>	<p>Corresponding Parts: Pairs of sides or angles, one from each polygon, which are congruent (\cong)</p> <p style="color: green;">Corresponding angles</p> <p style="color: red;">Corresponding sides</p> <p style="color: red;">$ABCD \cong EFGH$</p>
<p>Notation for Measurement (Angles & Sides): "EQUALS"</p> <p>Lengths: AB (no segment bar) $m\angle A$ (add "m" in front of name)</p> <p>Examples: 1) $AB = 6 \text{ cm}$ or $AB = DE$ 2) $m\angle A = 60^\circ$ or $m\angle A = m\angle B$</p>	<p>Notation for Objects (Angles & Sides): "CONGRUENT"</p> <p>Same size <u>AND</u> shape</p> <p>Examples: 1) $\overline{AB} \cong \overline{CD}$ 2) $\angle A \cong \angle B$</p> <div style="border: 2px solid blue; border-radius: 50%; padding: 10px; width: fit-content; margin: 10px auto; background-color: #4a7ebb; color: white;"> <p>***Never use numbers or AB or $m\angle A$ with \cong symbol***</p> </div>

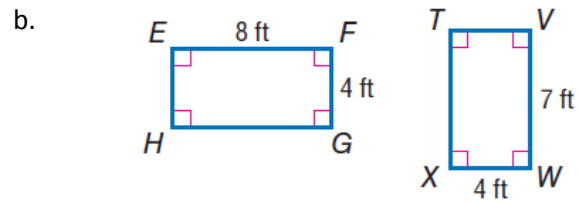
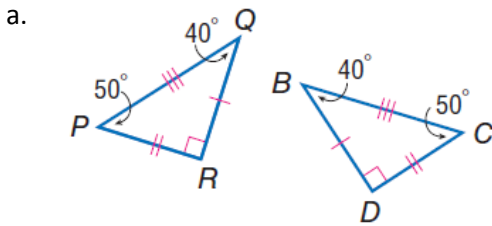
Note: When studying geometry, drawings are not always done to scale. This means:

- 1) Objects may be congruent when they do not look like it – evidence is measurements given or congruent features marked
- 2) Objects may NOT be congruent when they look like they are – evidence is missing that would be needed in order to confirm congruence.

You should **NEVER** have to measure angles or lengths with rulers or protractors in these types of problems. You should rely only on the information provided or information that you can solve for using properties of the shapes or other math knowledge (algebra, etc.).

Examples:

1. Are each of the pairs of polygons below congruent? Why or why not? If they are, provide a congruence statement.



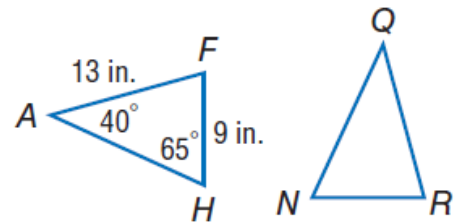
YES NO Why? 3 pairs \cong sides, 3 pairs \cong \angle 's
 \cong Statement: $\Delta PRQ \cong \Delta CDB$

YES **NO** Why? Sides not \cong ($EF \neq VW$)
 \cong Statement: N/A

***Note: the 3 \angle 's in a Δ add to 180°**

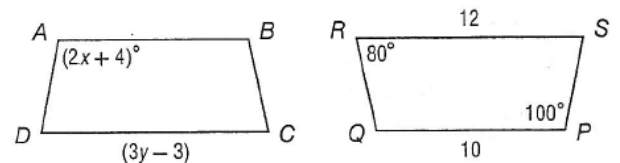
2. Given $\Delta AFH \cong \Delta QRN$, fill in the missing information requested below.

- a. $m\angle F =$ 75°
- b. $m\angle Q =$ 40°
- c. $m\angle R =$ 75°
- d. $m\angle N =$ 65°
- e. $\angle F \cong$ $\angle R$
- e. $QR =$ 13in
- f. $RN =$ 9in
- g. $\overline{AH} \cong$ \overline{QN}
- h. $\overline{NR} \cong$ \overline{HF}
- i. $AH =$ QN



3. Given $ABCD \cong PQRS$:

- a. Solve for x. $m\angle A = m\angle P$
 $2x + 4 = 100$
 $2x = 96$
 $x = 48$
- b. Solve for y. $DC = SR$
 $3y - 3 = 12$
 $3y = 15$
 $y = 5$



Circle the appropriate symbol and fill in the rest of the statement using the diagram above. Give the most specific answer possible:

- c. $AD \cong$ PS
- d. $\angle A \cong$ $\angle P$
- e. $m\angle A \cong$ 100°
- f. $\overline{CD} \cong$ \overline{RS}

4. Given $\Delta ABC \cong \Delta DEF$: Solve for x and y.

- $m\angle D = m\angle A$
- $2y - 5 = 65$
- $2y = 70$
- $y = 35$
- $EF = BC$
- $2x + y = 90.6$
- $2x + 35 = 90.6$
- $2x = 55.6$
- $x = 27.8$

