

### Congruent Figures

**Congruent** figures have the same shape and size. The equal sides and angles of congruent figures are called **corresponding** sides and angles.

$\triangle ABC$  is congruent to  $\triangle DEF$ .

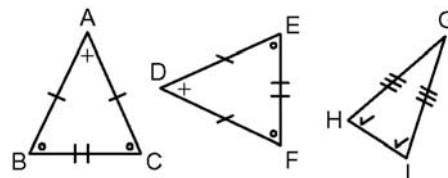
$$\angle A = \angle D$$

$$\angle B \text{ and } \angle C = \angle E \text{ and } \angle F$$

$$\overline{AB} \text{ and } \overline{AC} = \overline{DE} \text{ and } \overline{DF}$$

$$\overline{BC} = \overline{EF}$$

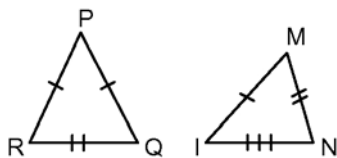
This could also be written as  $\triangle ABC \cong \triangle DEF$ .



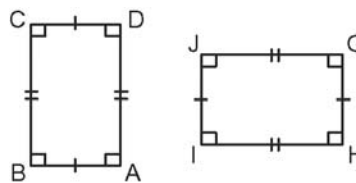
$\triangle ABC$  is not congruent to  $\triangle GHI$ . The sides and the angles are not equal.

1. Are the figures in each pair congruent? Explain your reasoning.

a)



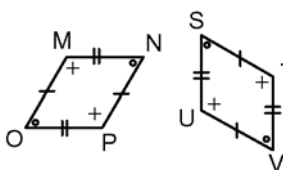
b)



c)



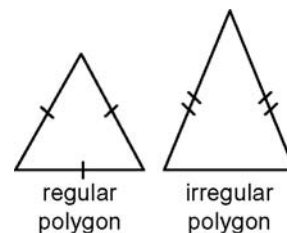
d)



2. For any congruent figures you found in #1, list the corresponding sides and angles.

### Characteristics of Regular Polygons

A **regular polygon** has all sides equal and all angles equal. An equilateral triangle is an example of a regular polygon. An **irregular polygon** is one that does not have all sides and angles equal. An isosceles triangle is an example of an irregular polygon.



3. Decide if each polygon is regular or irregular. Give reasons for your decisions.

a)



b)



c)



d)



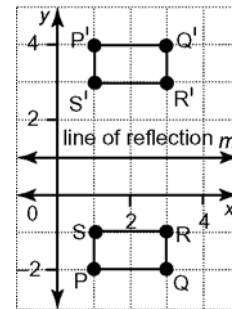
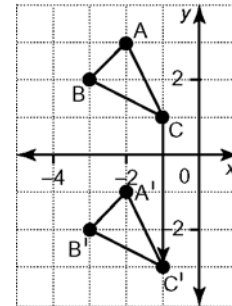
4. Draw and label one regular polygon and one irregular polygon.

**Transformations and Transformation Images**

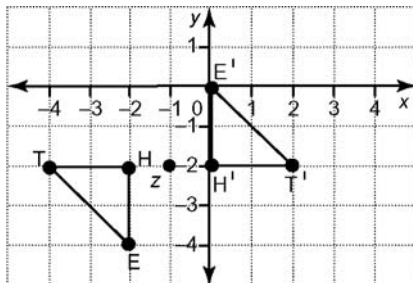
A **transformation** moves one geometric figure onto another. Transformations include translations, rotations, and reflections. The transformed figure is called an **image**.

$\Delta ABC$  has been translated 4 units vertically down. The translation image is  $\Delta A'B'C'$ . The coordinates are  $(-2, -1)$ ,  $(-3, -2)$ , and  $(-1, -3)$ .

Rectangle PQRS has been reflected in the line of reflection,  $m$ . The coordinates of  $P'Q'R'S'$  are  $(1, 4)$ ,  $(3, 4)$ ,  $(3, 3)$ , and  $(1, 3)$ .

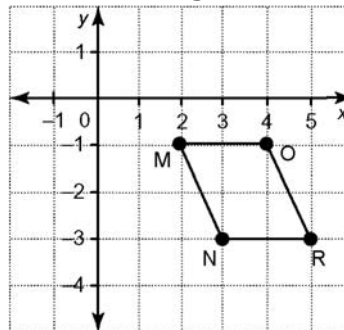


5.  $\Delta THE$  is rotated around the centre of rotation,  $z$ .



- What are the coordinates of  $\Delta THE$  and  $\Delta T'H'E'$ ?
- What are the direction and angle of rotation?

6. Copy parallelogram MORN onto a coordinate grid.



- Translate MORN 3 units up and 4 units left.
- Identify the coordinates of the translation image.
- Draw a line of reflection,  $t$ , parallel to the  $y$ -axis at  $-2$ .
- Reflect  $M'O'R'N'$  in line of reflection  $t$ .