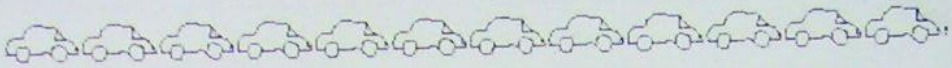
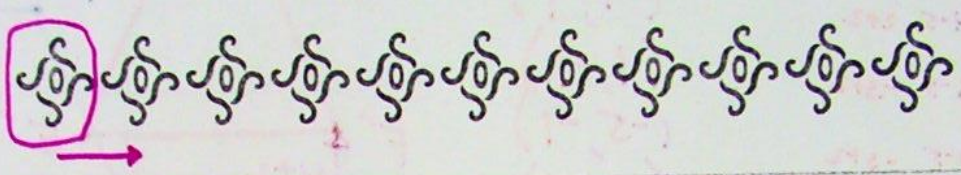
Translational Symmetry

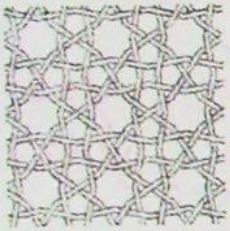


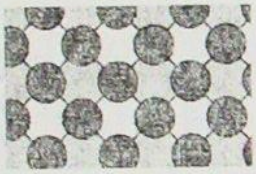
An image has **Translational Symmetry** if it can be divided by straight lines into a sequence of identical figures. Translational symmetry results from moving a figure a certain distance in a certain direction also called translating (moving) by a vector (length and direction).

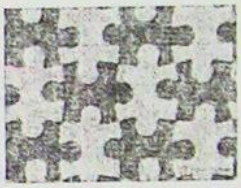


A tessellation is created when a shape is repeated over and over again covering a plane without any gaps or overlaps.

Another word for a tessellation is a **tiling**.







NOTES for Translational Symmetry

1. Name the coordinates of the image and its translation. State the rule for the transformation.

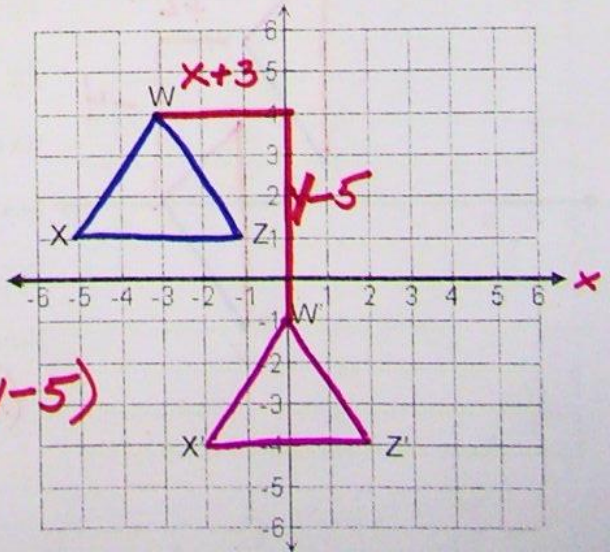
x+3

W (-3,4) → W' (0,-1)

X (-5,1) → X' (-2,-4)

Z (-1,1) → Z' (2,-4)

General rule: (x,y) → (x+3, y-5)



NOTES for Translational Symmetry, continued

2. The vertices of a polygon are listed. Name the coordinates of the image's translation given the general rule for the transformation. Graph and label the original polygon and its image.

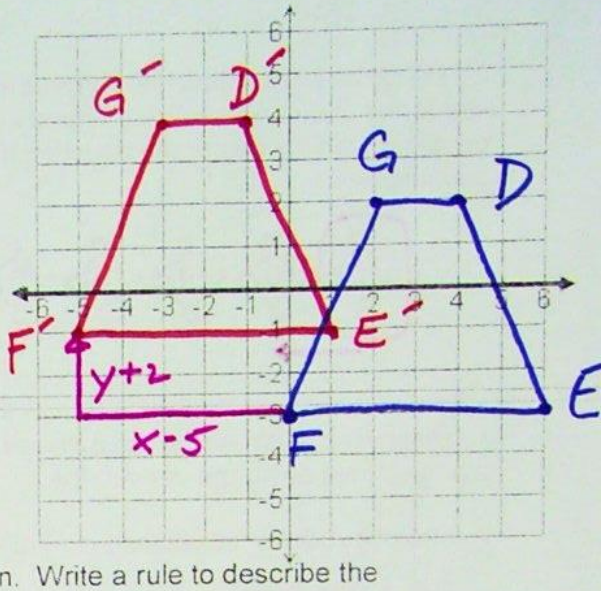
General rule: (x, y) → (x – 5, y + 2)

D (4, 2) → D' (-1, 4)
4-5 2+2

E (6, -3) → E' (1, -1)
6-5 -3+2

F (0, -3) → F' (-5, -1)
0-5 -3+2

G (2, 2) → G' (-3, 4)
2-5 2+2

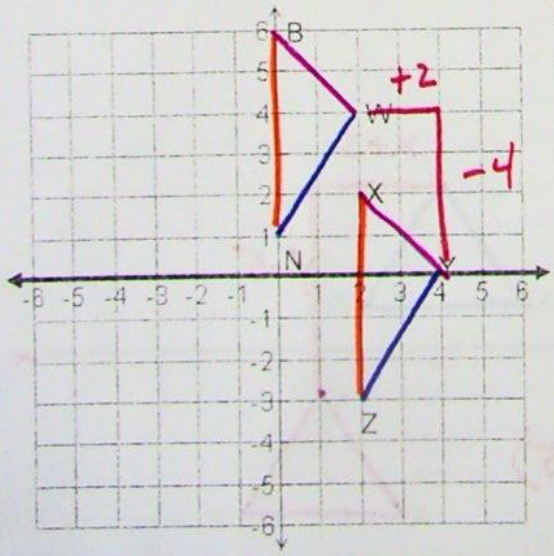


3. A point and its image after a translation are given. Write a rule to describe the translation.

a. The translation that takes A(8, -6) to A'(9, -3) (x, y) → (x+1, y+3)

b. The translation that takes B(2, -10) to B'(2, -12) (x, y) → (x, y-2)
x+0,

4. A translational transformation also results in a congruent figure. Identify the congruent parts for triangle XYZ that was translated 2 units to the left and 4 units up.



$\overline{XY} \cong$ $\overline{BW}$ $\angle W \cong$ $\angle Y$

$\overline{YZ} \cong$ $\overline{WN}$ $\angle N \cong$ $\angle Z$

$\overline{ZX} \cong$ $\overline{BN}$ $\angle B \cong$ $\angle X$

$\Delta XYZ \cong$ ΔBWN (order matters)

State the coordinates of W and its corresponding vertex:

W: (2, 4) Y (4, 0)

Write the general rule for the translation

(x, y) → (x+2, y-4)