H. Geometry
The First (and easiest) Transformation: Translations

Translations	

Example 1: Use the translation $(x, y) \rightarrow (x-5, y+8)$.

1. What is the image of $B(4,2)$?

2. What is the image of $D(21,5)$?

3. What is the preimage of $F'(23, 24)$?

4. What is the preimage of $H'(7,25)$?

5. What is the image of $J(0,2)$?

6. What is the preimage of $K'(24,6)$?

Example 2: Instead of writing a "rule" like $(x+2, y-5)$ many times we just use what is called a vector.

A vector is just the direction you would like the translation to go.

So $(x+2, y-5)$ would be $<2,-5>$ as a vector.

a) Translate the $\triangle ABC$ using the vector $<2,3>$ What are the coordinates

of the image? A' _____ B' _____ C' _____

b) What is the area of triangle ABC _____

c) What is the area of triangle A'B'C' _____

d) What property about translations does part b and c reinforce?
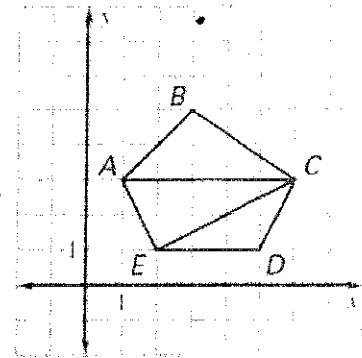
Example 3: Practice writing and using vectors.

Given the preimage: Write the image using the translation rule:

$A(2,8)$

$B(5,-3)$ **a)** $(x,y)--> (x+2,y)$ **b)** $(x,y)---> (x-3,y+3)$ **c)** $(x,y)--> (x-1,y+4)$

$C(-4,7)$

Vector_____   Vector_____   Vector_____

Image _____   Image _____   Image _____

Example 4 : Translate $\triangle ABC$ 3 units left and 2 units down.

1) Rule? $(x,y)--< \quad , \quad >$

Pre image: Image:
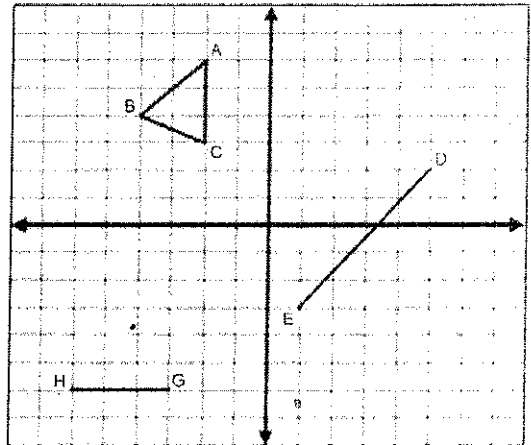
Translate $\overline{ED}$: 5 units right and 6 units up.
down.

Translate $\overline{GH}$: 7 units left and 9 units

H. Geometry
The First (and easiest) Transformation: Translations

Translations	Moving or sliding a figure - All move the distance and direction • Isometry / Rigid Motion

Example 1: Use the translation $(x, y) \rightarrow (x-5, y + 8)$.

1. What is the image of $B(4,2)$?

$B'(-1, 10)$

↑ pay attention to signs

2. What is the image of $D(21,5)$?

$D'(16, 13)$

3. What is the preimage of $F'(23, 24)$?

$F(28, 16)$

4. What is the preimage of $H'(7, 25)$?

$H(13, 17)$

*go in reverse

5. What is the image of $J(0,2)$?

$J'(-5, 10)$

6. What is the preimage of $K'(24,6)$?

$K(29, -2)$

Example 2: Instead of writing a "rule" like (x+2,y-5) many times we just use what is called a vector.

A vector is just the direction you would like the translation to go.

So (x+2,y-5) would be <2,-5> as a vector.

$(x+2, y+3)$

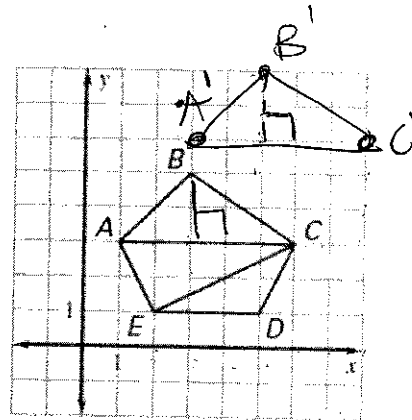**a) Translate the $\triangle ABC$ using the vector <2,3> What are the coordinates**

of the image? A' $(3, 6)$ B' $(5, 0)$ C' $(8, 6)$

b) What is the area of triangle ABC $5 u^2$ $A = \frac{1}{2}bh$

c) What is the area of triangle A'B'C' $5 u^2$

d) What property about translations does part b and c reinforce?

rigid transformation

isometry

$b = 5$

$h = 2$

$A = \frac{1}{2}(5)(2)$

$A = 5$

Example 3: Practice writing and using vectors.

Given the preimage: Write the image using the translation rule:

$A(2,8)$

$B(5,-3)$ **a)** $(x,y)-->(x+2,y)$ **b)** $(x,y)-->(x-3,y+3)$ **c)** $(x,y)-->(x-1,y+4)$

$C(-4,7)$

Vector $\langle 2,0\rangle$ Vector $\langle -3,3\rangle$ Vector $\langle -1,4\rangle$

Image $(4,8)$ Image $(2,0)$ Image $(-5,11)$

Example 4 : Translate $\triangle ABC$ 3 units left and 2 units down.

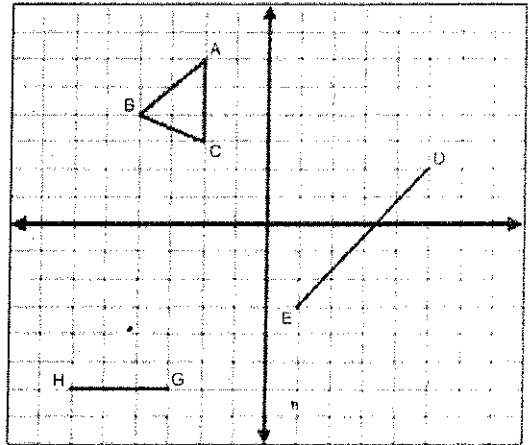1) Rule? $(x,y)--\langle -3, -2\rangle$

Pre image: Image:

$A(-2,6)$ $A'(-5,4)$

$B(-4,4)$ $B'(-7,2)$

$C(-2,3)$ $C'(-5,1)$

Translate $\overline{ED}$: 5 units right and 6 units up.
down.

$E(1,-3) \to E'(6,3)$

$D(5,2) \to D'(10,8)$

$\langle -7, -9\rangle$

Translate $\overline{GH}$: 7 units left and 9 units

$G(-3,-6) \to G'(-10,-15)$

$H(-6,-6) \to H'(-13,-15)$