

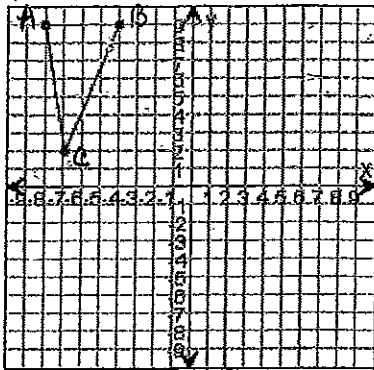
TRANSLATIONS



TRANSLATIONS

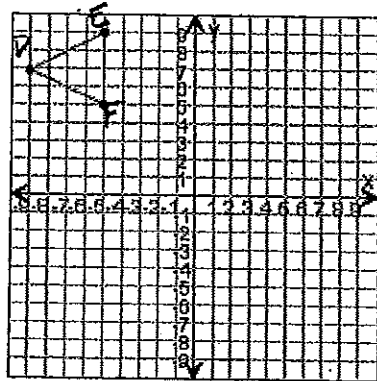


- Sliding left or right, THEN up or down \longrightarrow $T(-4,5)$ means:
slide the shape _____ units _____ and _____ units _____.
- Left or right = x coordinate (\longleftrightarrow) Up or down = y coordinate (\updownarrow)
- Have a graph? Just count from the original and drop the new point!
- Don't forget to label the images with prime (') marks!



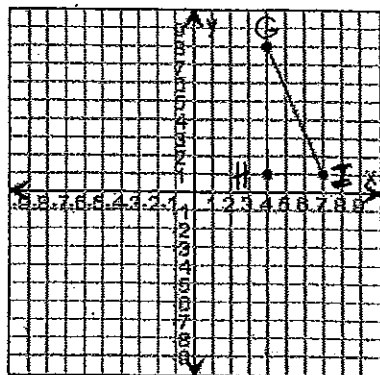
1. Translate the triangle 6 units down.
What is the translation coordinate? $T(\underline{\hspace{2cm}})$
(x, y)

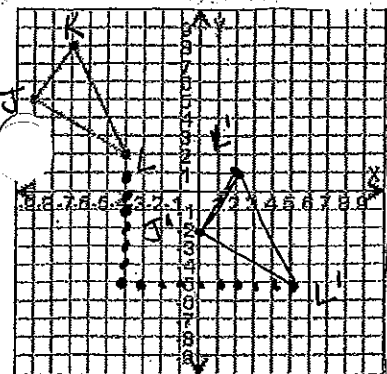
Hint: you aren't moving left or right so what will the x coordinate be?



2. Translate the triangle $T(9, -2)$.
"9 units _____ and 2 units _____."

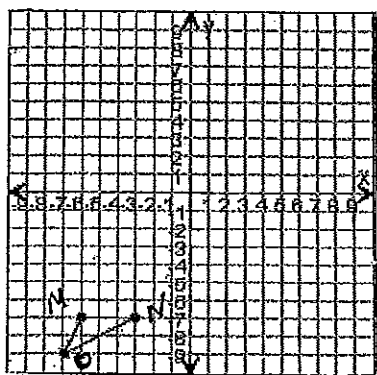
3. Translate the triangle $T(-4,1)$.
"4 units _____ and 1 unit _____."





4. Name the translation that has brought triangle ABC to A'B'C'

5. Translate the triangle T(0,7)



- Don't have a graph? Don't worry!
- Add the translation coordinate to the originals! X to X and Y to Y:

Ex. Point A (3,-2). Translate it without using a graph T(4,5). Here's how:

A (3,-2) ← write down the coordinates of the original

+ (4,5) ← add the translation coordinate- line up x's and y's

A' (7, 3) ← this is the image of A

Try this doing one point at a time:

1. Translate $\triangle ABC$ using T(5, -3).

A (4,5)

B (10, 2)

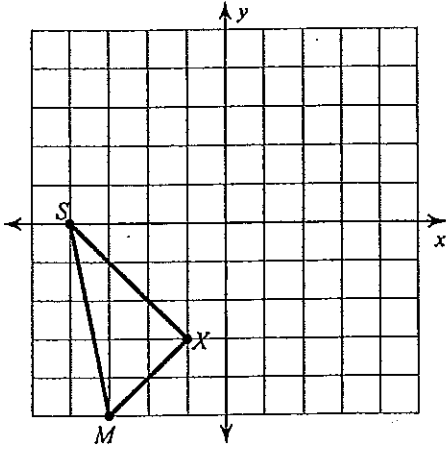
C (-2, -6)

Where will $\triangle A'B'C'$ be?

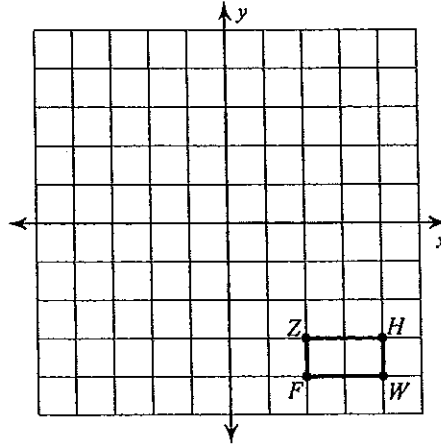
Translations

Graph the translation. Remember to label your points with ' marks!

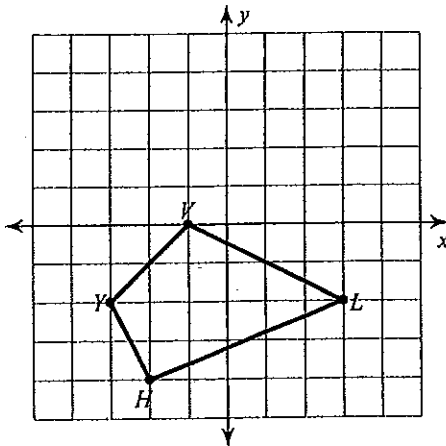
1) translation: 4 units right and 2 units up



2) translation: 5 units left and 5 units up

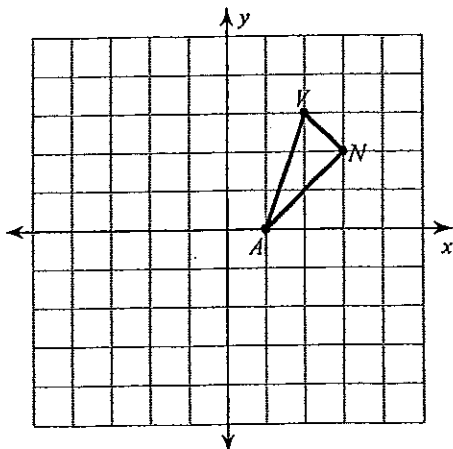


3) translation: 1 unit right and 5 units up

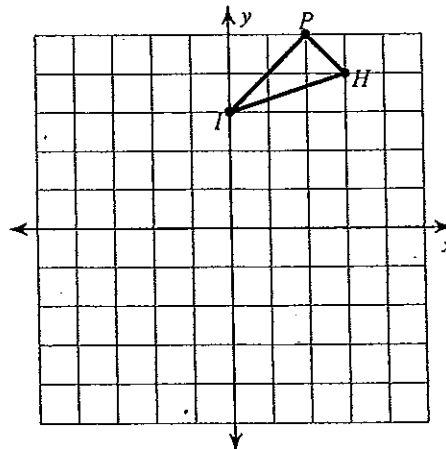


Graph the translation. Remember to label the points with ' marks!

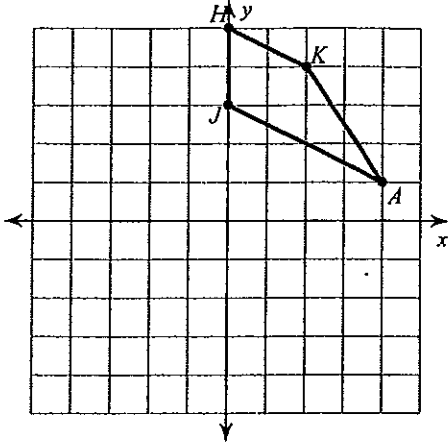
4) translation: $(2, 1)$



5) translation: $(0, -1)$



6) translation: $(-4, -4)$



Find the new coordinates of the vertices for each figure after the translation. Show your work.

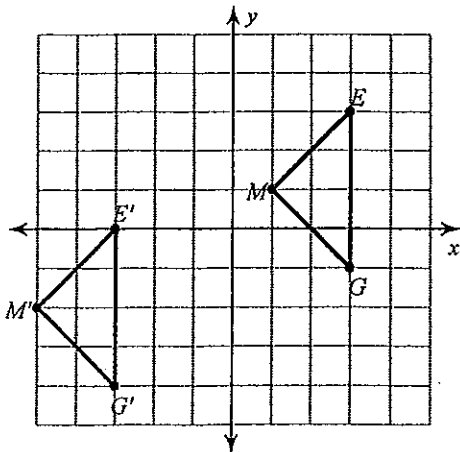
7) translation: 4 units left and 6 units down
 $K(4, 2), U(5, 4), J(5, 2)$

8) translation: 7 units right
 $F(-4, 3), E(-3, 5), Y(-3, 3)$

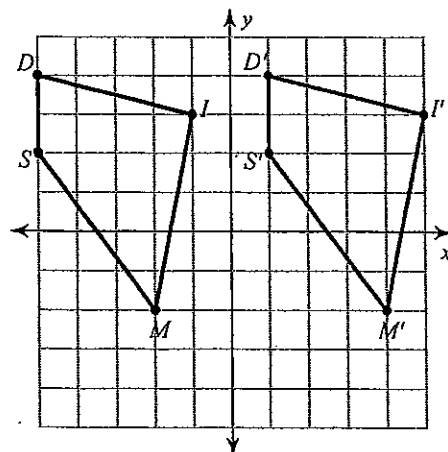
9) translation: 2 units left and 1 unit down
 $V(3, 0), T(1, 5), E(2, 5), P(5, 2)$

Write a rule to describe each translation in words.

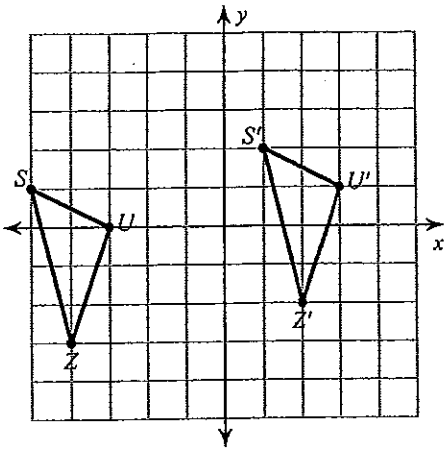
10)



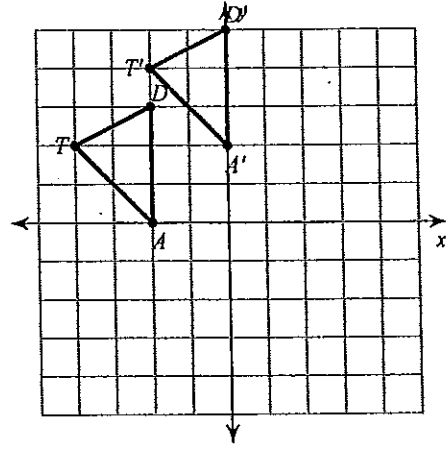
11)



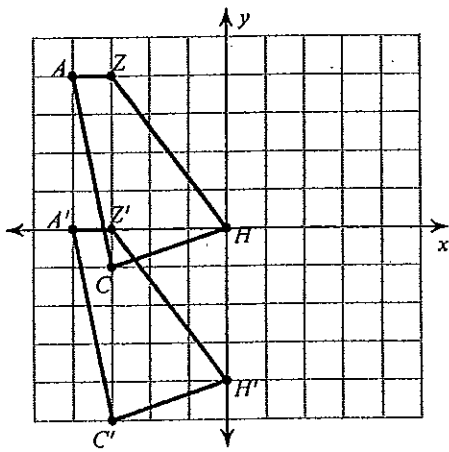
12)



13)



14)

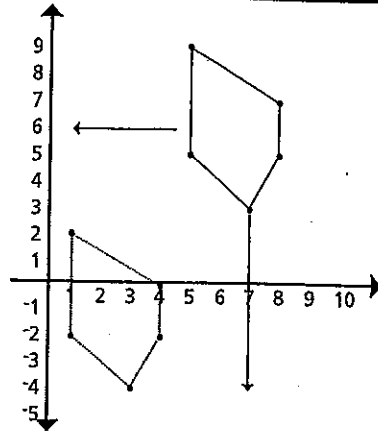


Oblique Translations

GEOMETRY

Adding or subtracting a constant value to the X-axis and Y-axis of each point of a figure will translate it to another location on the grid.

x, y	$(x - 4), (y - 7)$
(7, 3)	(3, -4)
(5, 5)	(1, -2)
(5, 9)	(1, 2)
(8, 7)	(4, 0)
(8, 5)	(4, -2)



Record the translated coordinates on the table. Then, draw an XY axis on graph paper and check your work by plotting both sets of points.

1

$(x + 5), (y - 5)$	
Figure	Translation
(2, 4)	
(2, 5)	
(6, 5)	
(6, 4)	

2

$(x - 7), (y + 6)$	
Figure	Translation
(1, 3)	
(1, 7)	
(3, 5)	
(3, 2)	

3

$(x - 3), (y - 10)$	
Figure	Translation
(12, 5)	
(9, 3)	
(12, 2)	
(15, 3)	

4

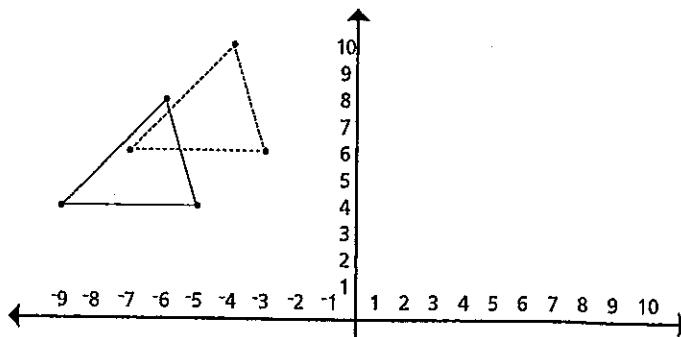
$(x + 8), (y + 8)$	
Figure	Translation
(-4, -2)	
(-2, -4)	
(-3, -5)	
(-2, -7)	
(-4, -7)	
(-5, -5)	
(-4, -4)	
(-6, -2)	

Exploring Linear Equations

INTEGERS

Adding or subtracting a constant value to the X-axis of each point of a figure will translate it along the X-axis.

Rule = $(x + 2), (y+2)$	
Figure	Translation
$(-9, 4)$	$(-7, 6)$
$(-6, 8)$	$(-4, 10)$
$(-5, 4)$	$(-3, 6)$



Complete each table.

1

Rule = $(x + 2), (y+1)$	
Figure	Translation
$(-9, 4)$	$(-8, 5)$
$(-6, 8)$	$(-5, 9)$
$(-5, 4)$	$(-4, 5)$

2

Rule = _____	
Figure	Translation
$(5, 5)$	$(4, 8)$
$(6, 10)$	$(5, 13)$
$(8, 8)$	$(7, 11)$
$(8, 5)$	$(7, 8)$

3

Rule = _____	
Figure	Translation
$(3, -9)$	$(7, -11)$
$(7, -3)$	$(11, -5)$
$(8, -6)$	$(12, -8)$
$(6, -9)$	$(10, -11)$

4

Rule = _____	
Figure	Translation
$(-6, 2)$	$(-12, 3)$
$(-7, 4)$	$(-14, 5)$
$(-6, 6)$	$(-12, 7)$
$(-7, 8)$	$(-14, 9)$
$(-6, 10)$	$(-12, 11)$

5

Rule = _____	
Figure	Translation
$(-9, 4)$	$(-8, 12)$
$(-6, 8)$	$(-5, 24)$
$(-5, 4)$	$(-4, 12)$

6

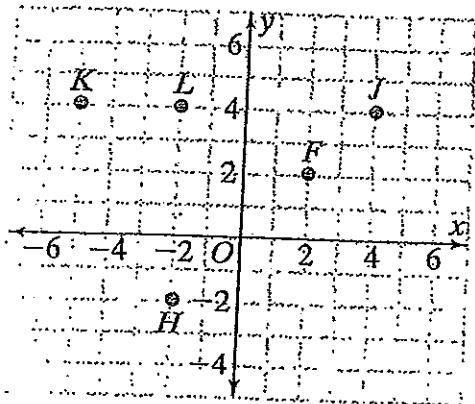
Rule = _____	
Figure	Translation
$(5, 5)$	$(11, 5)$
$(6, 10)$	$(13, 10)$
$(8, 8)$	$(17, 8)$
$(8, 5)$	$(17, 5)$

Translations

Practice

Circle the letter of the best answer.

Use the figure below for Questions 1-4.



- Which point is the image of J after it is translated 9 units left?

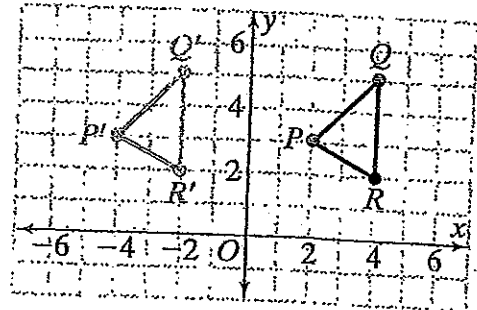
A point K	C point F
B point L	D point H
- Which point is the image of H after it is translated 6 units up?

F point K	H point F
G point J	J point L
- Point J is translated 2 units down and 2 units left. Which point below is the image of J ?

A point L	C point K
B point F	D point H
- Which describes how point K is transformed to point F ?

F translated 7 units left and 2 units down
G translated 7 units right and 2 units up
H translated 7 units right and 2 units down
J translated 2 units up and 7 units left

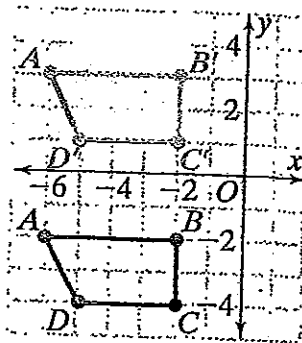
Use the figure below for Questions 5-6.



- How is $\triangle PQR$ transformed into $\triangle P'Q'R'$?

A translated 4 units left
B translated 4 units right
C translated 6 units left
D translated 6 units right
- Which relationship below shows that all points of $\triangle PQR$ move the same distance under a translation?

F $\overline{PQ} \cong \overline{P'Q'}$	H $\angle P \cong \angle P'$
G $\overline{QR} \cong \overline{Q'R'}$	J $PP' = QQ' = RR'$
- Which rule below describes the transformation of the figure $ABCD$?



- | | |
|---|---------------------------------|
| A | $(x, y) \rightarrow (x, y - 5)$ |
| B | $(x, y) \rightarrow (x, y + 3)$ |
| C | $(x, y) \rightarrow (x, y - 3)$ |
| D | $(x, y) \rightarrow (x, y + 5)$ |

Name: _____

Per. _____

Congruence Transformations

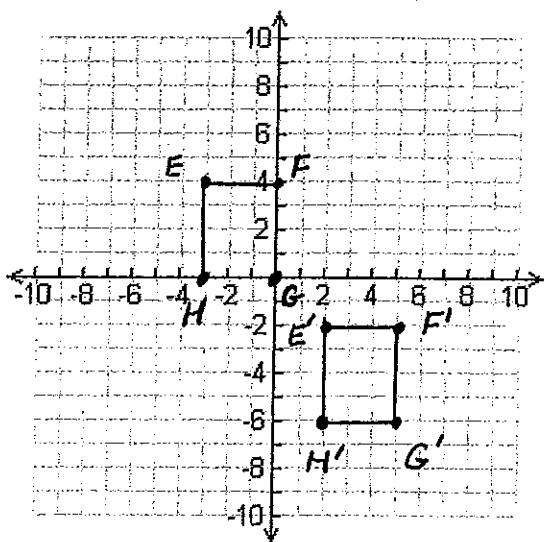
Rectangle EFGH is translated 5 units right and 6 units down to create rectangle E'F'G'H'.

Which pairs of sides are congruent?

Which pairs of sides are parallel?

What are the lengths of the sides?

Strategy Use the transformation to identify congruent parts.



Step 1: Identify the corresponding sides.

Step 2: Identify the congruent sides.

Step 3: Identify the parallel sides.

Step 4: Find the lengths of the sides.

