

# TRANSFORMATIONS

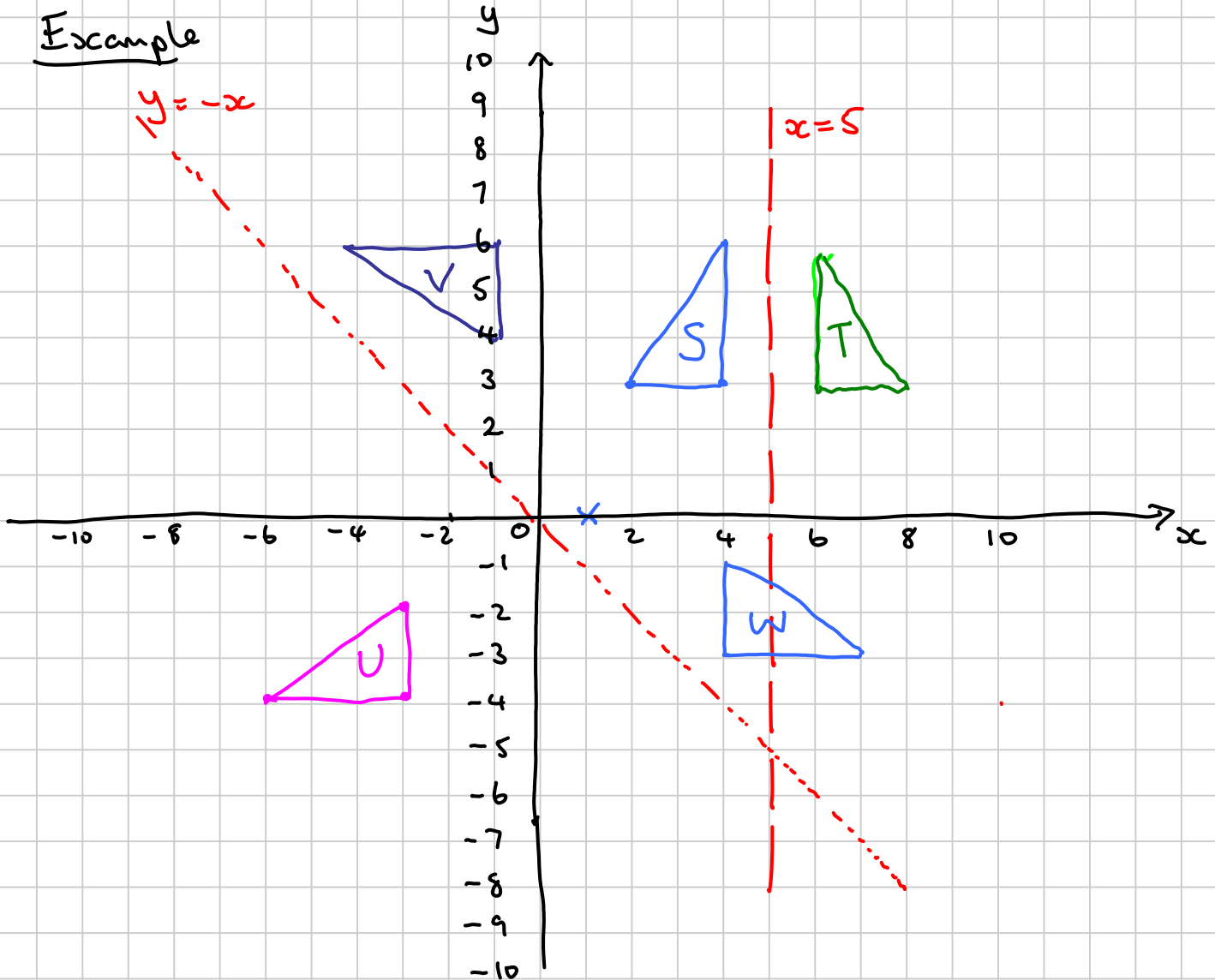
Note Title

27/01/2011

There are several types of transformation. We will look at:

- Reflections
- Rotations
- Translations

Example



- Plot shape S with vertices at  $(2, 3)$ ,  $(4, 3)$  and  $(4, 6)$
- Shape T is the IMAGE of S after a reflection in the line  $x = 5$ . Plot T.
- Shape U is the IMAGE of S after a reflection in the line  $y = -x$ . Plot U
- Shape V is the IMAGE of S after a rotation  $90^\circ$  anticlockwise around  $(0, 2)$
- Describe the transformation which takes shape S to shape W.

A ROTATION  $90^\circ$  Clockwise about the point  $(1, 0)$

# Translations

A translation is a slide in which the shape is not turned over or turned around.

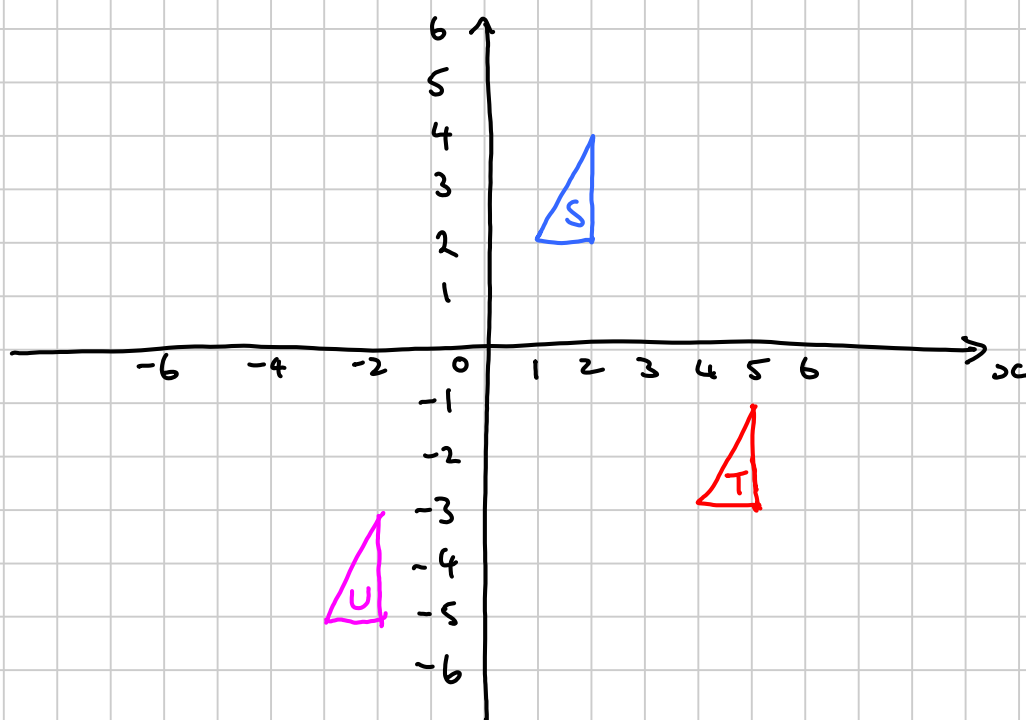
It is usually described by a COLUMN VECTOR

$$\begin{pmatrix} \overleftarrow{-} & \overrightarrow{+} \\ \downarrow & \uparrow \\ - & + \end{pmatrix}$$

For example  $\begin{pmatrix} 3 \\ -4 \end{pmatrix}$  means slide 3 units to the right and 4 units down.

$\begin{pmatrix} -6 \\ 0 \end{pmatrix}$  means slide 6 units to the left (and don't slide up or down)

## Example



- (a) T is the image of S after a translation  $\begin{pmatrix} 3 \\ -5 \end{pmatrix}$   
Plot T.
- (b) What translation would move T to S?  $\begin{pmatrix} -3 \\ 5 \end{pmatrix}$
- (c) U is the image of T after a translation  $\begin{pmatrix} -7 \\ -2 \end{pmatrix}$ .  
Plot U.
- (d) What translation would take S to U?  $\begin{pmatrix} -4 \\ -7 \end{pmatrix}$

[. Note that

$S \rightarrow T$  then  $T \rightarrow U$  makes  $S \rightarrow U$

$$\begin{pmatrix} 3 \\ -5 \end{pmatrix} + \begin{pmatrix} -7 \\ -2 \end{pmatrix} = \begin{pmatrix} -4 \\ -7 \end{pmatrix}$$

]