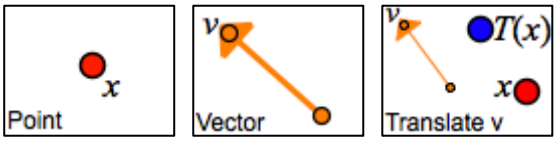
Translate Family 1 Names:

In this activity you will translate a point and compare the motion of the point to the motion of its translated image.

TRANSLATE BY A VECTOR

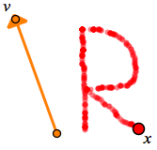
1. Open geometricfunctions.org/links/translate-family/. Go to page 2.
2. Use the first three tools 

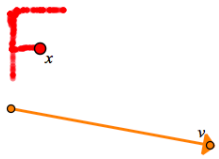
to create a translate function. When you use the Translate tool, be sure to match the end points of the vector correctly, and also match point x to point x.
3. Drag independent variable  on the screen and observe the behavior of  .
4. Drag point v to make the vector point straight up.

Q1 Turn on tracing and drag x. Fill in the blanks below, and draw a picture of the traces for each answer.

	Drag x left	**Drag x up**
Which way does $T_v(x)$ move?		
Which variable moves faster?		
Draw your traces:		

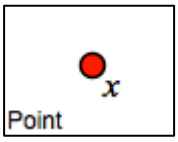
Q2 In each picture below, arrange the vector as shown and then vary x as shown. Draw the trace that $T_v(x)$ makes in each picture.

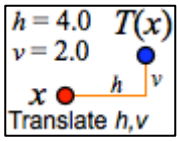




Translate Family 2 Names:

TRANSLATE HORIZONTALLY AND VERTICALLY

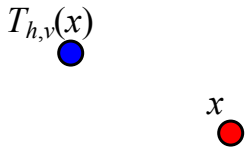
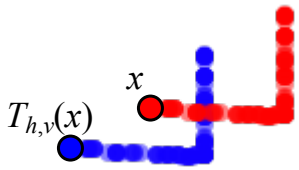
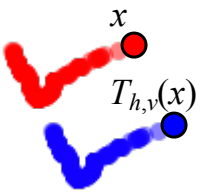
5. On page 3 use 

and 

to create a translate function.

For the *Translate h,v* tool, the *v* stands for *vertical,* not *vector*.

Q3 Edit *h* and *v* to make pictures like the ones below. Below each picture, give the value you used for *h,* and the value you used for *v*.

		
h = *v* =	*h* = *v* =	*h* = *v* =

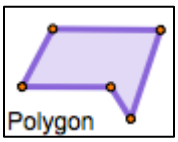
Q4 Explain how you can tell just by looking at the variables whether *h* and *v* are positive or negative.

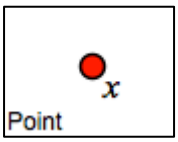
Q5 Try to find a fixed point for your translate function. (Remember, a fixed point is a place where *x* and $T_{h,v}(x)$ come together at the same time.)

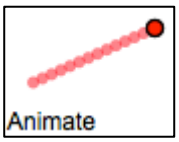
What did you find out?

Translate Family 3 Names:

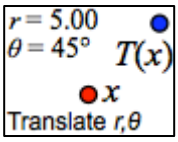
TRANSLATE BY ANGLE AND DISTANCE

6. On page 4, use the 



and 

tools to animate independent variable x around the polygon.

7. Use 

to translate x by distance r at angle θ.

Q6 Use these values of r and θ to make pictures. Show x and $T_{r,\theta}(x)$ in your drawings.

$r = 5.00$ $\theta = 120°$	$r = 6.00$ $\theta = 330°$	$r = -4.00$ $\theta = 60°$

TRANSLATION CHALLENGES

Q7 Solve the challenges presented on each page from 6 through 10, and draw pictures of your solutions below. Draw the vector (if you used *Translate v*) or write down the parameters (if you used *Translate h,v* or *Translate r, θ*).

6	7
8	9