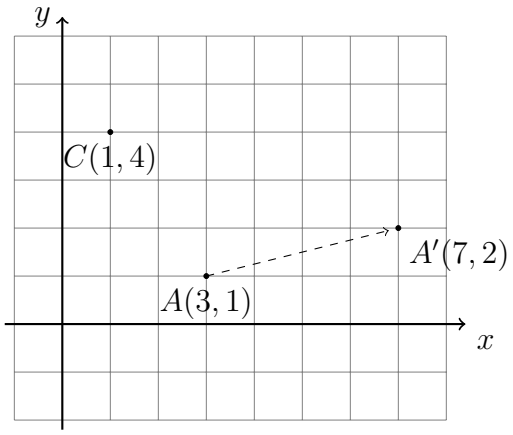
4.5 Translation and dilation

1. Do Now: A translation maps A to A', as shown, $A(3,1) \to A'(7,2)$.

   (a) What is the horizontal shift, how many squares right or left?

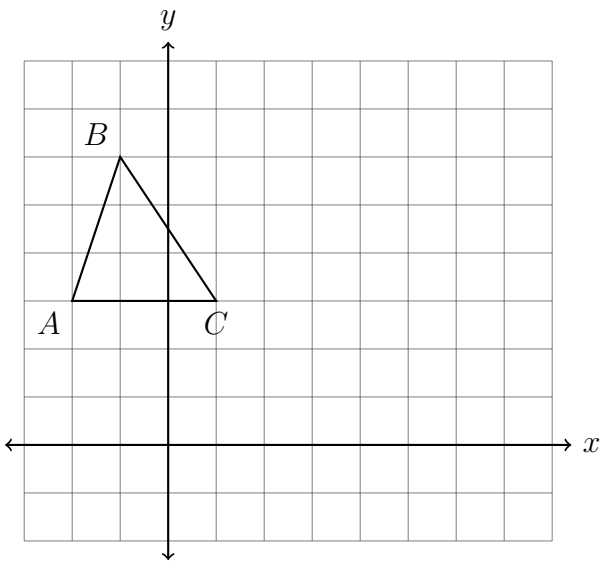
   (b) What is the vertical shift, how many squares up or down?

   (c) Apply the same translation to $C(1,4) \to C'(x,y)$. Label the point C' as an ordered pair.



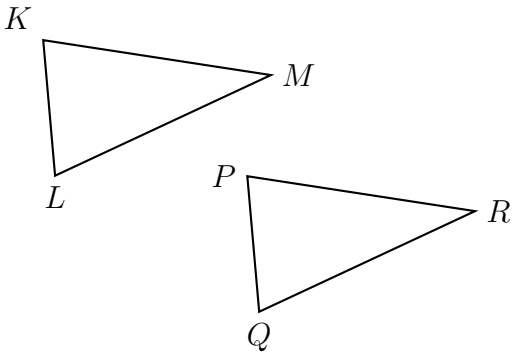
2. Vocabulary: A *preimage* is *mapped* to its *image*. For example, triangle ABC undergoes a transformation to make triangle $A'B'C'$.

   Translate $\triangle ABC$ by $(x, y) \to (x + 6, y - 2)$. Make a table of the coordinates and plot and label the image on the axes.



3. Vocabulary: A translation is a *rigid motion*, lengths and angles stay the same. *Corresponding* parts are congruent.

   A translation maps triangle KLM onto triangle PQR.



Write each corresponding object.

(a) $L \rightarrow$ _____

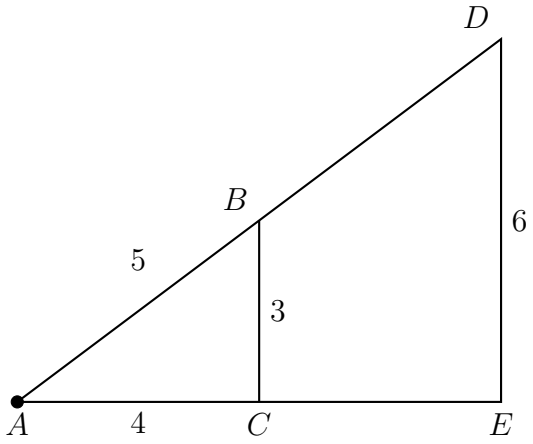
(b) $\angle M \cong$ _____

(c) $\overline{LM} \cong$ _____

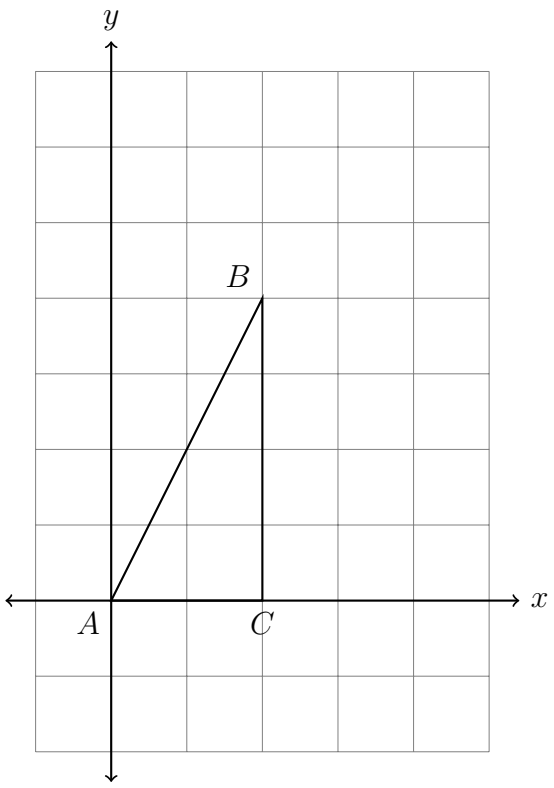
(d) Justify $\triangle KLM \cong \triangle PQR$. Use the words "rigid motion" and "translation".

4. A dilation centered at A with scale factor $k = 2$ maps $\triangle ABC \to \triangle ADE$. Given the sides of the preimage, $AC = 4$, $BC = 3$, $AB = 5$.

   $DE = 6$, how long are AD and AE?



5. Dilate $\triangle ABC \rightarrow \triangle A'B'C'$ by a factor of $k = 1.5$ centered at the origin, $(x, y) \rightarrow (2x, 2y)$. Plot and label the image on the axes. Make a table of the vertices and their coordinates.



6. Dilate $\triangle ABC \to \triangle A'B'C'$ by a factor of $k = 3$ centered at the origin, $(x, y) \to (3x, 3y)$. Plot and label the image on the axes. Make a table of the vertices and their coordinates.