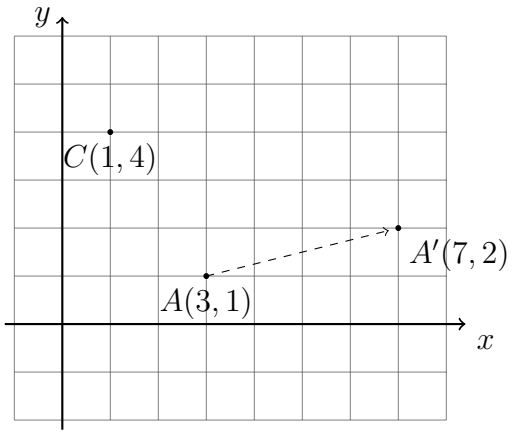
### 4.5 Translation and dilation

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?

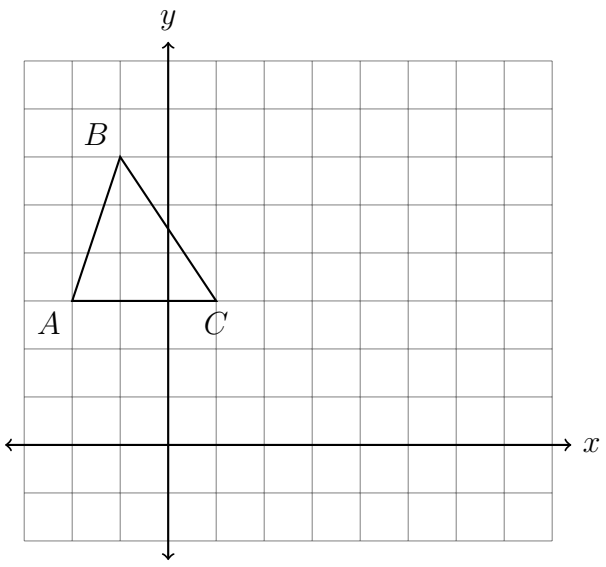
   (b) What is the vertical shift, how many squares up or down?

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



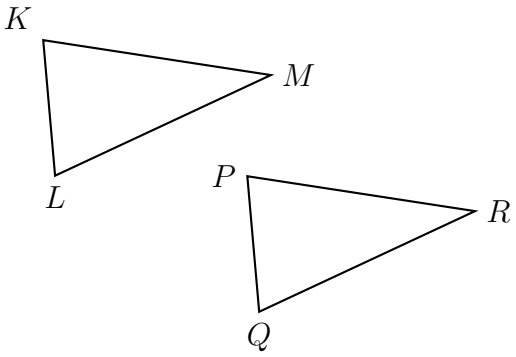
2. Vocabulary: A *preimage* is *mapped* to its *image*. For example, triangle $ABC$ undergoes a transformation to make triangle $A'B'C'$.

   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) $\angle M \cong$ _____

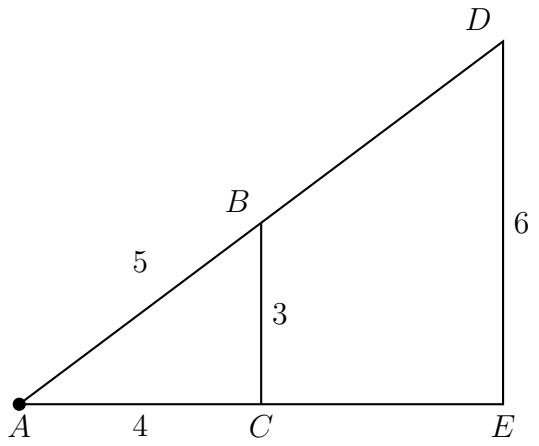
(c) $\overline{LM} \cong$ _____

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

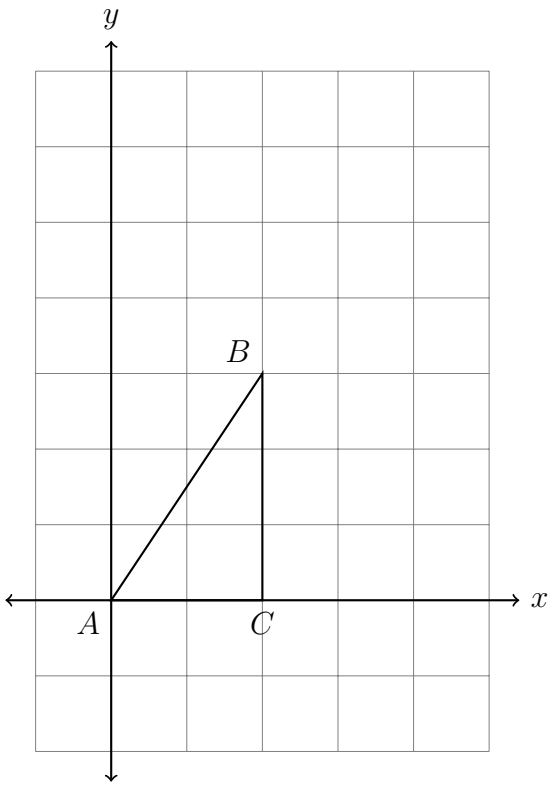
4. Vocabulary: A dilation stretches or shrinks. It has a *center* and a *scale factor, k*.

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



6. Rewrite the header correctly following MLA and punctuation conventions.

   Spicy: Write the text that would make the LaTeX note.
   (hint: "\triangle" makes a $\triangle$, "\rightarrow" makes an $\rightarrow$)

7. Perform a dilation in Geogebra and insert the image on this slide using the camera tool. Be sure to label the points, and fully describe the dilation. (specify its center and scale factor $k$)

8. 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.