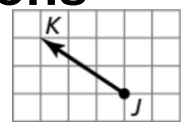
Name _____ Date _____ Per _____

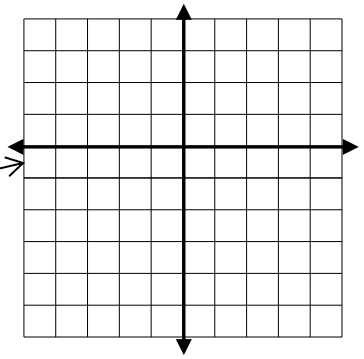
Worksheet 4.1 – Translations

1. Name the vector and write its component form.



2. The vertices of $\triangle ABC$ are $A(2, 3)$, $B(-1, 2)$, and $C(0, 1)$.

Translate $\triangle ABC$ using the vector $\langle 1, -4 \rangle$. Graph $\triangle ABC$ and its image.



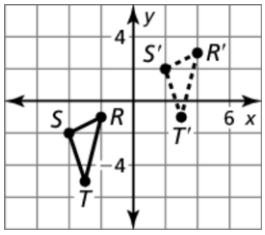
A′ B′ C′

3. Find the rule that translates $A(3, -2)$ to $A'(-1, 4)$.

a) vector component form: b) translation rule:

4. Write a rule for the translation of $\triangle RST$ to $\triangle R'S'T'$.

a) vector component form: b) translation rule:



c) Find the slope of the vector from each point's pre-image to its image. Describe how and why these slopes are related.

RR′: SS′: TT′:

d) Find each of the following distances (leave answers as radicals):

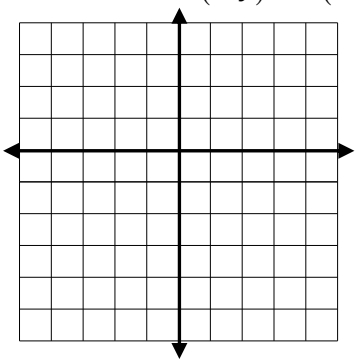
RS = R′S′ = RT =

In Exercises 5 and 6, use the translation $(x, y) \rightarrow (x + 1, y - 3)$ to find the image of the given point.

5. $Q(5, 9)$ **6.** $M(-3, -8)$

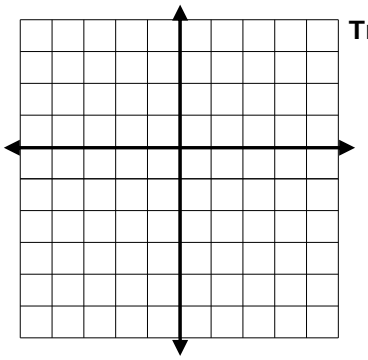
In Exercises 7 and 8, graph $\triangle CDE$ with vertices $C(-1, 3)$, $D(0, -2)$, and $E(1, 1)$ and its image after the given translation or composition. Label each vertex with its name and coordinates!

7.Translation: $(x, y) \rightarrow (x - 3, y + 1)$



8. **Translation:** $(x, y) \rightarrow (x + 10, y - 8)$

Translation: $(x, y) \rightarrow (x - 7, y + 4)$



9. Is the transformation given by $(x, y) \rightarrow (2x + 2, y + 1)$ a translation? Explain your reasoning.

10. Point $P(4, -2)$ undergoes a translation given by $(x, y) \rightarrow (x + 3, x - a)$, followed by another translation $(x, y) \rightarrow (x - b, x + 7)$ to produce the image of $P''(-5, 8)$. Find the values of *a* and *b* and point P'.