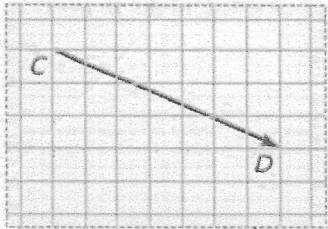


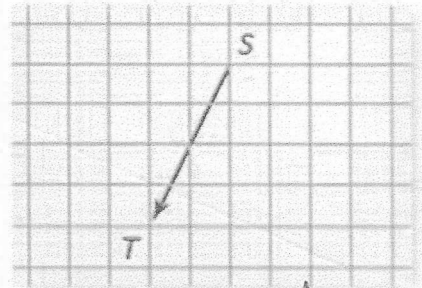
In Exercises 1 and 2, describe the vector (e.g. right 2 units, down 3 units) and write its component form (e.g. $\langle 2, -3 \rangle$).

1.



right 7, down 3
 $\langle 7, -3 \rangle$

2.



left 2, down 4
 $\langle -2, -4 \rangle$

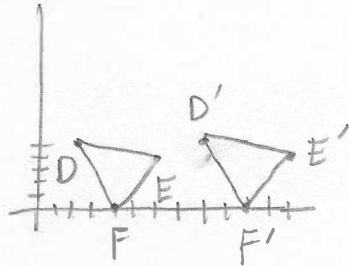
In Exercises 3 - 6, the vertices of $\triangle DEF$ are $D(2, 5)$, $E(6, 3)$, and $F(4, 0)$. For each vector:

a) Find the coordinates of the image of $\triangle DEF$ under a translation along the vector.

b) Graph $\triangle DEF$ and its image.

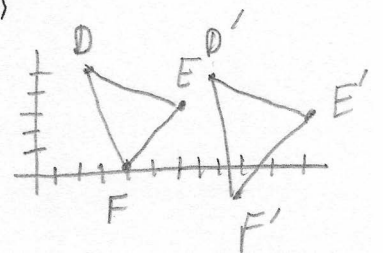
3. $\langle 6, 0 \rangle$

$D'(8, 5)$
 $E'(12, 3)$
 $F'(10, 0)$



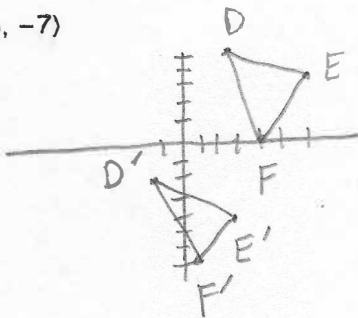
4. $\langle 5, -1 \rangle$

$D'(7, 4)$
 $E'(11, 2)$
 $F'(9, -1)$



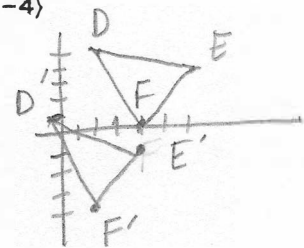
5. $\langle -3, -7 \rangle$

$D'(-1, -2)$
 $E'(3, -4)$
 $F'(1, -7)$



6. $\langle -2, -4 \rangle$

$D'(0, 1)$
 $E'(4, -1)$
 $F'(2, -4)$



In Exercises 7 and 8, find the component form of the vector that translates $P(-3, 6)$ to P' .

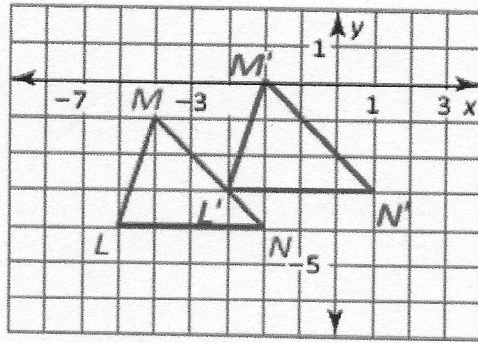
7. $P'(0, 1)$

$\langle 3, -5 \rangle$

8. $P'(-4, 8)$

$\langle -1, 2 \rangle$

9. Write the component form for the translation of $\triangle LMN$ to $\triangle L'M'N'$.



$\langle 3, 1 \rangle$

In Exercises 11–14, use the translation. $(x, y) \rightarrow (x - 8, y + 4)$

11. What is the image of $A(2, 6)$? $A'(-6, 10)$

12. What is the image of $B(-1, 5)$? $B'(-9, 9)$

13. What is the preimage of $C'(-3, -10)$? $C(5, -14)$

14. What is the preimage of $D'(4, -3)$? $D(12, -7)$

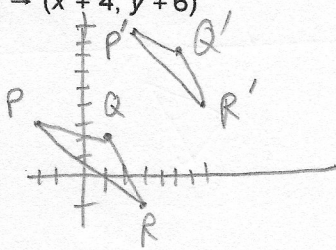
In Exercises 15 - 18, $\triangle PQR$ has vertices $P(-2, 3)$, $Q(1, 2)$, and $R(3, -1)$. For each translation:

a) Find the coordinates for the image of $\triangle PQR$.

b) Graph $\triangle PQR$ and its image.

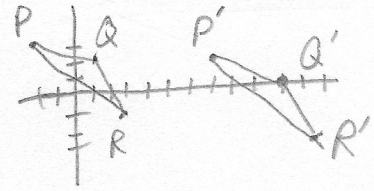
15. $(x, y) \rightarrow (x + 4, y + 6)$

$P'(2, 9)$
 $Q'(5, 8)$
 $R'(7, 5)$



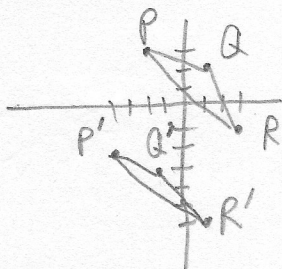
16. $(x, y) \rightarrow (x + 9, y - 2)$

$P'(7, 1)$
 $Q'(10, 0)$
 $R'(12, -3)$



17. $(x, y) \rightarrow (x - 2, y - 5)$

$P'(-4, -2)$
 $Q'(-1, -3)$
 $R'(1, -6)$



$P'(-3, 6)$
 $Q'(0, 5)$
 $R'(2, 2)$

18. $(x, y) \rightarrow (x - 1, y + 3)$

