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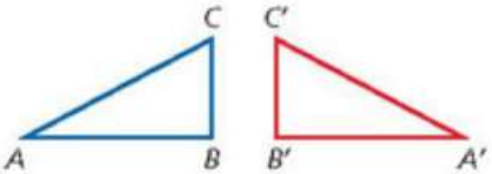
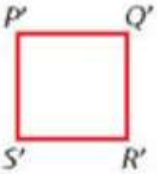
Identify each transformation. Then use arrow notation to describe the transformation.

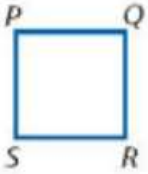
3.



Reflection. $\triangle ABC \rightarrow \triangle A'B'C'$

4.





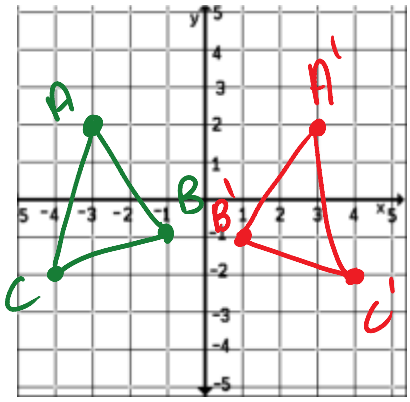
Translation.
$PQRS \rightarrow P'Q'R'S'$

5. A figure has vertices at $A(-3, 2)$, $B(-1, -1)$, and $C(-4, -2)$. After a transformation, the image of the figure has vertices at $A'(3, 2)$, $B'(1, -1)$, and $C'(4, -2)$. Draw the preimage and image. Then identify the transformation. Reflection

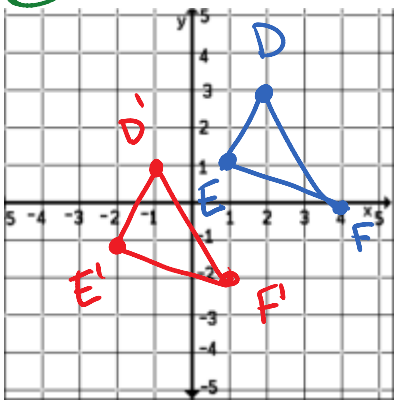
6. Multi-Step The coordinates of the vertices of $\triangle DEF$ are $D(2, 3)$, $E(1, 1)$, and $F(4, 0)$. Find the coordinates for the image of $\triangle DEF$ after the translation $(x, y) \rightarrow (x - 3, y - 2)$. Draw the preimage and image.

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

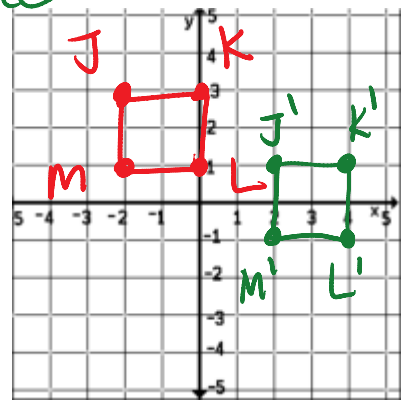
(5)



(6)



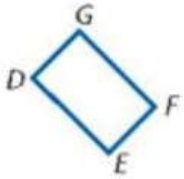
(10)



Identify each transformation. Then use arrow notation to describe the transformation.

8.

Rotation
$DEFG \rightarrow D'E'F'G'$

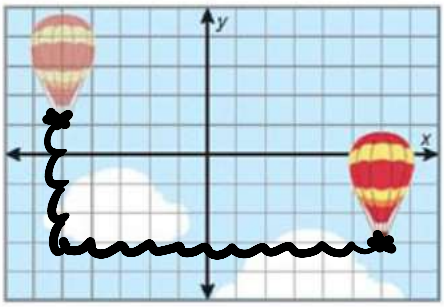


9.

Reflection
$WXYZ \rightarrow W'X'Y'Z'$

10. A figure has vertices at $J(-2, 3)$, $K(0, 3)$, $L(0, 1)$, and $M(-2, 1)$. After a transformation, the image of the figure has vertices at $J'(2, 1)$, $K'(4, 1)$, $L'(4, -1)$, and $M'(2, -1)$. Draw the preimage and image. Then identify the transformation. Translation

12. **Travel** Write a rule for the translation that maps the descent of the hot air balloon.



$\langle x,y \rangle \rightarrow \langle x-11, y+4 \rangle$

Which transformation is suggested by each of the following?

13. mountain range and its image on a lake
14. straight line path of a band marching down a street
15. wings of a butterfly

13. reflection
14. translation
15. reflection

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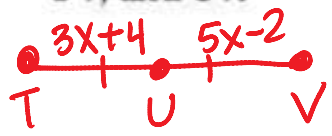
14. U is the midpoint of $\overline{TV}$, $TU = 3x + 4$, and $UV = 5x - 2$. Find TU, UV, and TV.

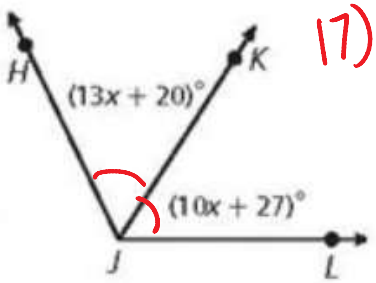


$3X+4=5X-2$
$6=2X$
$X=3$

$TU=13$
$UV=13$
$TV=26$

17. $m\angle HJL = 116°$. Find $m\angle HJK$. 59°

18. $\overrightarrow{NP}$ bisects $\angle MNQ$, $m\angle MNP = (6x - 12)°$, and $m\angle PNQ = (4x + 8)°$. Find $m\angle MNQ$. 96°



17) $13X+20+10X+27=116$
$23X+47=116$
$23X=69 \rightarrow X=3$

18) $6X-12=4X+8$
$X=10$