

Name: _____

4.1 Translations

Directions: Complete all translations on a separate piece of graph paper.

1. The vertices of $\triangle LMN$ are $L(2, 2)$, $M(5, 3)$, $N(9, 1)$. Translate $\triangle LMN$ using vector $\langle -2, 6 \rangle$

$$L'(0, 8) \quad M'(3, 9) \quad N'(7, 7)$$

2. Graph \overline{TU} with endpoints $T(1, 2)$ and $U(4, 6)$ and its image after the composition.

Translation: $(x, y) \rightarrow (x - 2, y - 3)$

$$T''(-5, 4)$$

Translation: $(x, y) \rightarrow (x - 4, y + 5)$

$$(X-6, Y+2) \quad U''(-2, 8)$$

3. Graph $\triangle RST$ with vertices $R(2, 2)$, $S(5, 2)$, and $T(3, 5)$ and its image after the translation $(x, y) \rightarrow (x + 1, y + 2)$.

$$R'(3, 4) \quad S'(6, 4) \quad T'(4, 7)$$

4. Graph \overline{VW} with endpoints $V(-6, -4)$ and $W(-3, 1)$ and its image after the composition.

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

$$V'(-9, -7)$$

Translation: $(x, y) \rightarrow (x - 6, y - 4)$

$$(X-3, Y-3) \quad W'(-9, -2)$$

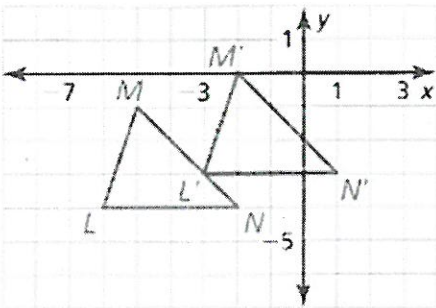
5. The vertices of $\triangle DEF$ are $D(2, 5)$, $E(6, 3)$, and $F(4, 0)$. Translate $\triangle DEF$ using the given vector $\langle 5, -1 \rangle$. Graph the pre-image and the image.

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

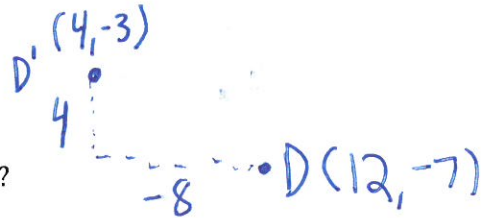
6. Find the component form of the vector that translates $P(-3, 6)$ to $P'(-4, 8)$.

$$\langle -1, 2 \rangle$$

7. Write the rule for the translation of $\triangle LMN$ to $\triangle L'M'N'$.



$$(X, Y) \rightarrow (X+3, Y+1)$$

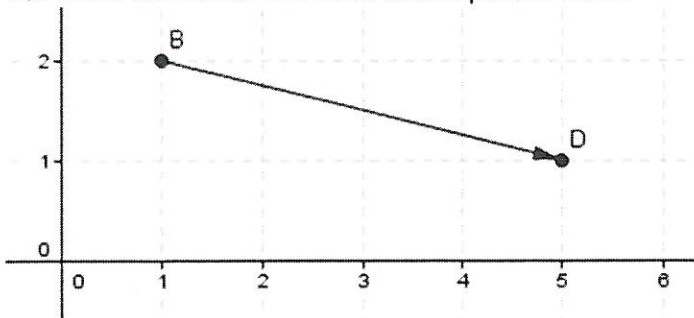


8. What is the pre-image of $D'(4, -3)$ using the translation $\langle -8, 4 \rangle$?

9. Graph $\triangle PQR$ with vertices $P(-2, 3)$, $Q(1, 2)$, and $R(3, -1)$ and its image after the translation $(x, y) \rightarrow (x + 9, y - 2)$.

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

10. Name the vector and write its component form.



$$\vec{BD} \quad \langle 4, -1 \rangle$$

11. Find the component from of the vector that translate A(7, 11) to A'(2, 13).

$\langle -5, 2 \rangle$

12. What is the image of Q(4, 2) if the rule is $(x, y) \rightarrow (x + 5, y - 4)$.

$Q'(9, -2)$

13. What is the preimage of D' if the rule is $(x, y) \rightarrow (x - 3, y - 6)$.

Not enough info.

14. Write the equation of the line that passes through (1, 6) and (-1, 14).

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15. Write the equation of the line that is perpendicular to $y = 3x + 7$ and passes through (-2, 5).

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16. Find the midpoint of the segment with endpoints (2, 5) and (-4, 13).

17. Find the distance between the points (2, 5) and (-3, -7).

14 $m = \frac{14-6}{-1-1} = \frac{8}{-2} = -4$

16 $\frac{2+(-4)}{2}, \frac{5+13}{2}$

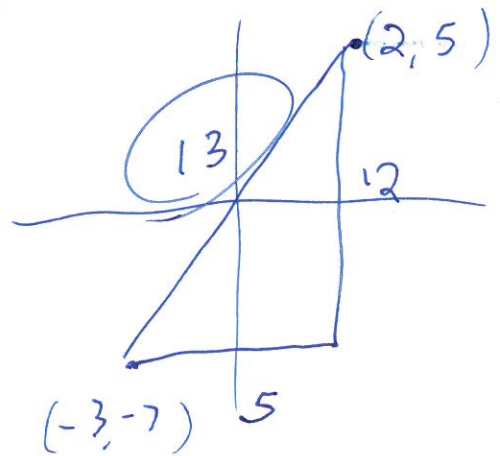
$(-1, 9)$

$y - 6 = -4(x - 1)$
 $y - 14 = -4(x + 1)$ } Point slope

$y - 14 = -4x - 4$
+14 +14

$y = -4x + 10$ slope intercept.

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15 $m = -\frac{1}{3}$ (perpendicular, opposite reciprocal)

$y - 5 = -\frac{1}{3}(x + 2)$ point slope

$y - 5 = -\frac{1}{3}x - \frac{2}{3}$
+5 +5

$y = -\frac{1}{3}x + \frac{13}{3}$

$5^2 + 12^2 = D^2$
 $25 + 144 = D^2$

$\sqrt{169} = \sqrt{D^2}$

$13 = D$