

Consider the following.

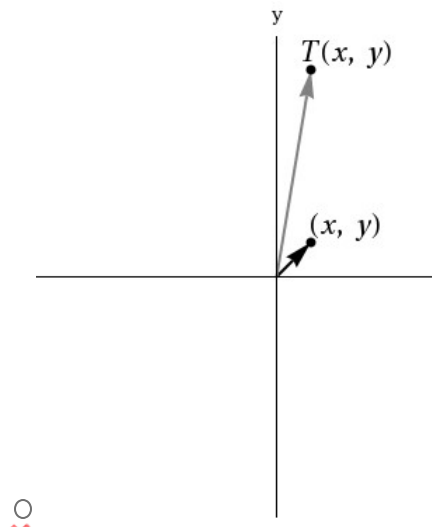
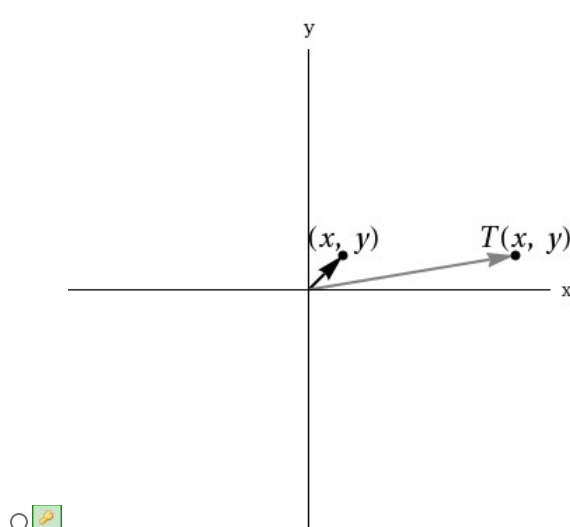
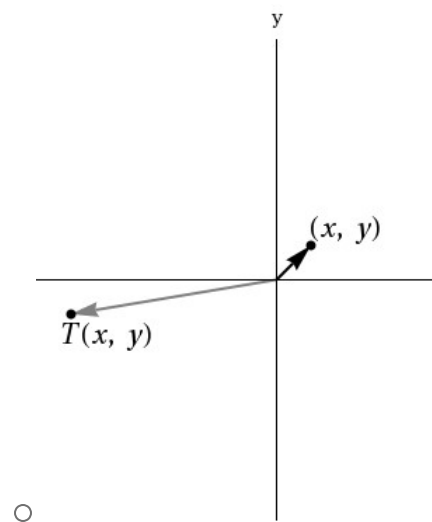
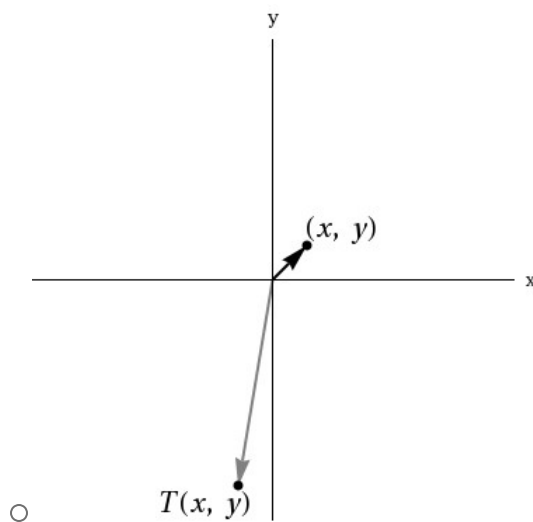
$$T(x, y) = (x + 5y, y)$$

(a) Identify the transformation.

- ☐ vertical expansion
- ☐ horizontal expansion
- ☐ vertical shear
- ☐ horizontal contraction
- ☐  horizontal shear
- ☐ vertical contraction



(b) Graphically represent the transformation for an arbitrary vector in  $\mathbb{R}^2$ .



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2. 0/20 points

LarLinAlg8 6.5.045. [3706442]

Give a geometric description of the linear transformation defined by the elementary matrix.

$$A = \begin{bmatrix} 1 & 0 \\ 0 & 4 \end{bmatrix}$$

- ☐ horizontal shear
- ☐ vertical contraction
- ☐ horizontal contraction
- ☐ horizontal expansion
- ☐ vertical shear
- ☒  vertical expansion



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3. 0/20 points

LarLinAlg8 6.5.501.XP. [3706222]

Give a geometric description of the linear transformation defined by the elementary matrix below.

$$A = \begin{bmatrix} 1 & 0 \\ 0 & -1 \end{bmatrix}$$

- ☒  reflection about the x-axis
- ☐ reflection about the y-axis
- ☐ reflection about the line  $y = x$
- ☐ reflection about the line  $y = -x$



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4. 0/20 points

LarLinAlg8 6.5.051. [3848550]

Give a geometric description of the linear transformation defined by the matrix product.

$$A = \begin{bmatrix} 6 & 0 \\ 6 & 1 \end{bmatrix} = \begin{bmatrix} 6 & 0 \\ 0 & 1 \end{bmatrix} \begin{bmatrix} 1 & 0 \\ 6 & 1 \end{bmatrix}$$

- ☐ a horizontal expansion followed by a vertical shear
- ☐ a vertical expansion followed by a horizontal shear
- ☐ a horizontal shear followed by a vertical expansion
- ☐ a horizontal expansion followed by a horizontal shear
- ☒  a vertical shear followed by a horizontal expansion



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Give a geometric description of the linear transformation defined by the matrix product.

$$A = \begin{bmatrix} 0 & 8 \\ 1 & 0 \end{bmatrix} = \begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix} \begin{bmatrix} 1 & 0 \\ 0 & 8 \end{bmatrix}$$

- ☐ a reflection in the line  $x = y$  followed by a vertical expansion
- ☐ a horizontal expansion followed by a reflection in the line  $x = y$
- ☐ a reflection in the line  $x = y$  followed by a vertical shear
- ☐  a vertical expansion followed by a reflection in the line  $x = y$
- ☐ a reflection in the line  $x = y$  followed by a horizontal shear



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