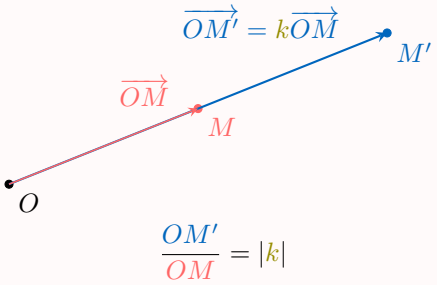
HOMOTHETY

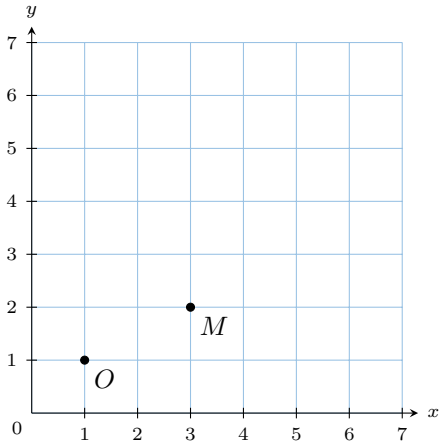
A WHAT IS A HOMOTHETY?

Definition Homothety of a Point

The **homothety** of point M with center O and scale factor k is the point M' such that $\overrightarrow{OM'} = k\overrightarrow{OM}$. In particular, the points O, M, and M' lie on the same line, and the distance from O to M' is $|k|$ times the distance from O to M.

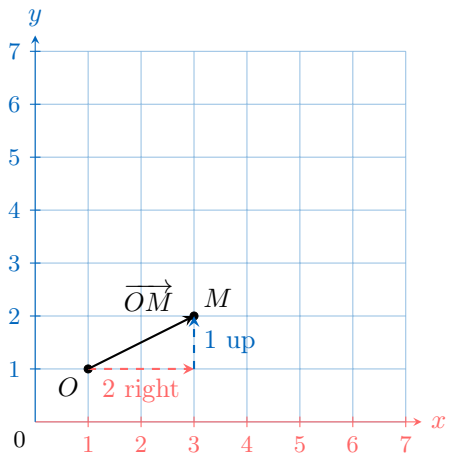


Ex: Find the coordinates of the image of point M under a homothety with center O and scale factor $k = 2$.

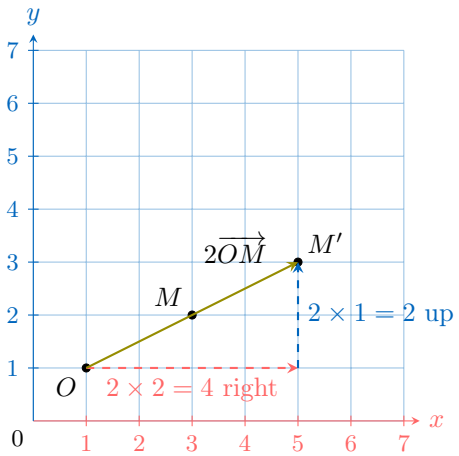


Answer:

- $\overrightarrow{OM}$:



- $\overrightarrow{OM'} = 2\overrightarrow{OM}$:



- $M'(5, 3)$

Definition **Homothety**

The **homothety** of a figure with center O and scale factor k is the image obtained by applying the homothety with center O and scale factor k to all its points.

Ex: The figure A' is the image of figure A under a homothety with center O and scale factor 2.