Linear Transformations Visualization

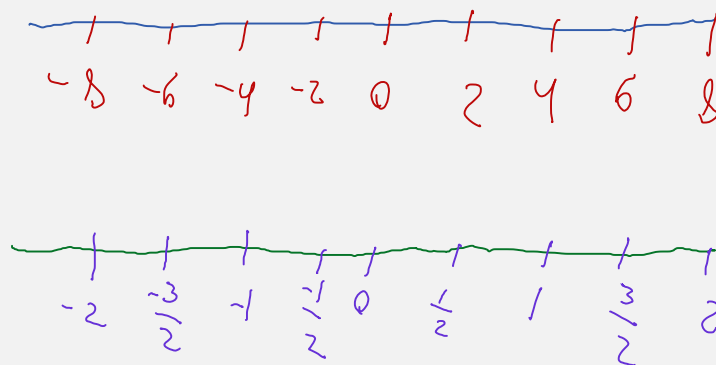$$T : \mathbb{R} \to \mathbb{R} \quad 1 \text{ dimension}$$

$$T(X) = 2X$$

[Linear transformation]

-4 -3 -2 -1   1   2   3   4

-8 -6 -4 -2   0   2   4   6   8

$$T(X) = \frac{1}{2} X$$

-2 $\frac{-3}{2}$ -1 $\frac{-1}{2}$ 0 $\frac{1}{2}$ 1 $\frac{3}{2}$ 2

Property

① Origin must be fixed

② All lines must remain lines