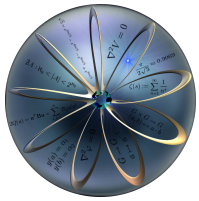

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## image of a linear transformation

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**Definition** Let $T : V \to W$ be a linear transformation. Then the **image** of $T$ is the set

$$\mathrm{Im}(T) = \{w \in W \mid w = T(v) \,\text{for some}\, v \in V\} = T(V).$$

### 0.0.1 Properties

1. The dimension of $\mathrm{Im}(T)$ is called the rank of $T$;
2. $T$ is a surjection, if and only if $\mathrm{Im}(T) = W$;
3. $\mathrm{Im}(T)$ is a vector subspace of $W$;
4. If $L\colon W \to U$ is a linear transformation, then $\mathrm{Im}(LT) = L(\mathrm{Im}(T))$;