

Let  $U$  and  $V$  be vector spaces over a field  $F$ .

A linear transformation (also called a linear mapping, linear operator or, in some contexts, linear function) is a function between two modules (including vector spaces) that preserves the operations of module (or vector) addition and scalar multiplication.

Thus a function  $T:U \rightarrow V$  such that  $T(u_1+u_2)=T(u_1)+T(u_2)$ , for  $u_1, u_2 \in U$  and  $T(\alpha u)=\alpha T(u)$  for  $\alpha \in F$  and  $u \in U$  is called a linear transformation.

**ANSWER: linear transformation.**