$$\lambda(x+y) = \lambda x + \lambda y \quad \forall \ \lambda \in \mathbb{F} \ , \ x, y \in \mathbb{F}^n$$

$$\lambda(x+y) = \lambda(x_1 + y_1, \dots, x_n + y_n)$$
$$= (\lambda(x_1 + y_1), \dots, \lambda(x_n + y_n))$$
$$= (\lambda x_1 + \lambda y_1, \dots, \lambda x_n + \lambda y_n)$$
$$= \lambda x + \lambda y$$