

$$(a+b)x = ax + bx \quad \forall a, b \in \mathbb{F}, x \in \mathbb{F}^n$$

$$(a+b)x = (a+b)(x_1, \dots, x_n)$$

$$= (ax_1 + bx_1, \dots, ax_n + bx_n)$$

$$= (ax_1 + bx_1, \dots, ax_n + bx_n)$$

$$= ax + bx$$

