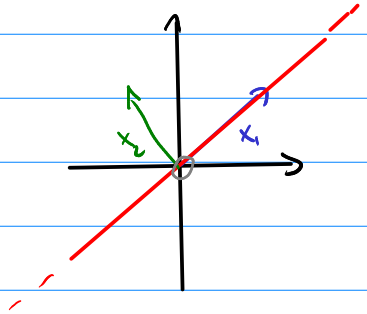
Vector space $x+y$ αx

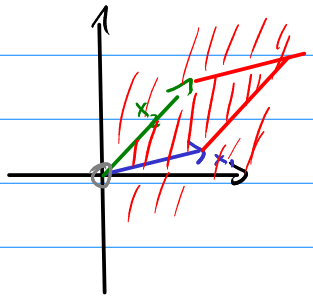
linear combination

scalars vectors

$\alpha_1 x_1 + \alpha_2 x_2 + \alpha_3 x_3 + \cdots + \alpha_n x_n$

"coefficient"

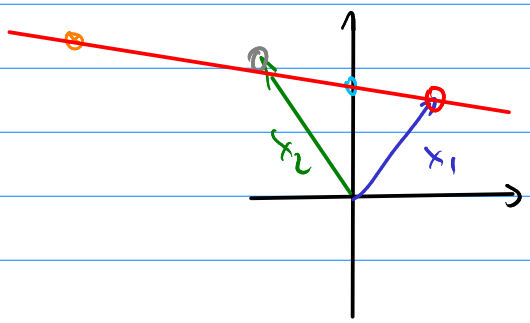




affine combination

$\alpha_1 x_1 + \alpha_2 x_2 + \alpha_3 x_3 + \cdots + \alpha_n x_n$

$\alpha_1 + \cdots + \alpha_n = 1$



$(\alpha_1, \alpha_2) = (1, 0)$

$(\alpha_1, \alpha_2) = (0, 1)$

$(\alpha_1, \alpha_2) = (0.5, 0.5)$

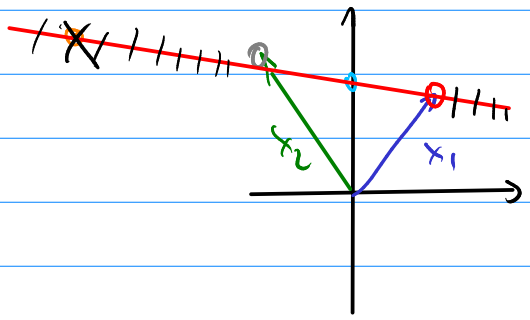
$(\alpha_1, \alpha_2) = (-1, 2)$

convex combination

$$\alpha_1 x_1 + \alpha_2 x_2 + \alpha_3 x_3 + \cdots + \alpha_n x_n$$

$$\alpha_1 + \cdots + \alpha_n = 1$$

$$\alpha_1, \alpha_2, \ldots, \alpha_n \geq 0$$



$(\alpha_1, \alpha_2) = (1, 0)$

$(\alpha_1, \alpha_2) = (0, 1)$

$(\alpha_1, \alpha_2) = (0.5, 0.5)$

$(\alpha_1, \alpha_2) = (-1, 2)$