Ex:-3

$S_1 = \{(x,y) \in \mathbb{R}^2 : x = y\}$

$S_2 = \{(x_1, x_2) \in \mathbb{R}^2 : \frac{x_1}{x_2} = 2\}$

Let $u, v \in S_2$

$\Rightarrow u = (2x_1, 2x_2)$

$v = (2y_1, 2y_2)$

$\alpha u + \beta v = \alpha(2x_1, 2x_2) + \beta(2y_1, 2y_2)$

$= (2\alpha x_1 + 2\beta y_1, 2\alpha x_2 + 2\beta y_2)$

$= (2\alpha x_1 + 2\beta y_1, 2(\alpha x_2 + \beta y_2)) \in S_2$

Ex:-3 $S_1 = \{(x,y) \in \mathbb{R}^2 : x = y\}$

$S_2 = \{(x_1, x_2) \in \mathbb{R}^2 : \frac{x_1}{x_2} = 2\}$

Let $u, v \in S_2$

$u = (2x_1, x_1)$

$v = (2y_1, y_1)$

$\alpha u + \beta v = (2(\alpha x_1 + \beta y_1), \alpha x_1 + \beta y_1) \in S_2$ for $\alpha, \beta \neq 0$.

But $(0,0) \notin S_2$ as $\frac{0}{0} \neq 2$.