

Example (x, x, y) is li. dep

$$1x + (-1)x + 0 \cdot y = 0$$

Example Assume (x, y, z) is li. indep

Prove (x, y) is also li. indep

Proof. Let $\alpha x + \beta y = 0$

Then $\alpha x + \beta y + \gamma z = 0$ for $\gamma = 0$

$\therefore \alpha = \beta = \gamma = 0$ since (x, y, z) is li. indep

$\therefore (x, y)$ is li. indep. QED

To prove (x^1, \dots, x^t) is li. dep. Find (argue) that there exist $\alpha_1, \dots, \alpha_t$, not all zero such that

$$\alpha_1 x^1 + \dots + \alpha_t x^t = 0$$

Example Assume (x, y, z) is li. dep.

Prove (w, x, y, z) is also li. dep.

Proof. $\because (x, y, z)$ is li. dep.

$\therefore \exists \alpha, \beta, \gamma$, not all zero, s.t.

$$\alpha x + \beta y + \gamma z = 0$$

$\therefore 0 \cdot w + \alpha x + \beta y + \gamma z = 0$

and $0, \alpha, \beta, \gamma$ are not all zero QED.

To prove (x^1, \dots, x^t) is li. indep.

$$\text{Let } \alpha_1 x^1 + \dots + \alpha_t x^t = 0$$

$$\text{argue } \alpha_1 = \alpha_2 = \dots = \alpha_t = 0$$

HW, Read §2, 3, Chap. 3.

P108 #1, #6(b,c) 6d extra credit

P119 #8

Due. Tue.