(4)

$$R_2 \begin{bmatrix} 1 & 2 & 0 & -1 \\ 0 & 1 & 0 & -1 \\ 0 & 0 & 1 & 2 \end{bmatrix}$$

$$R_1 \quad -2R_2$$

$$R \begin{bmatrix} 1 & 0 & 0 & 1 \\ 0 & 1 & 0 & -1 \\ 0 & 0 & 1 & 2 \end{bmatrix}$$

$$\boxed{c_1 = 1}, \quad \boxed{c_2 = -1}, \quad \boxed{c_3 = 2}$$

(b) Find the vector v in R^3 whos coordinate vector with respect to the basis S

$(v)_s = (-1, 3, 2)$

Solution

$$v = c_1v_1 + c_2v_2 + c_3v_3$$
$$v = (-1)(1,2,1) + (3)(2,9,0) + (2)(3,3,4)$$
$$v = (-1,-2,-1) + (6,27,0) + (6,6,8)$$
$$v = (-1+6+6, -2+27+6, -1+0+8)$$
$$\boxed{v = (11, 31, 7)}$$