

First Part in Photo

$$n=3$$

$$1^4 + 2^4 + 3^4 = \frac{3^5}{5} + 3^4 \lambda_4 + 3^3 \lambda_3 + 3^2 \lambda_2 + 3 \lambda_1$$

$$98 = \frac{243}{5} + 81\lambda_4 + 27\lambda_3 + 9\lambda_2 + 3\lambda_1$$

$$n=4$$

$$1^4 + 2^4 + 3^4 + 4^4 = \frac{4^5}{5} + 4^4 \lambda_4 + 4^3 \lambda_3 + 5 \cdot 4^2 \lambda_2 + 4 \lambda_1$$

$$354 = \frac{1024}{5} + 256\lambda_4 + 64\lambda_3 + 16\lambda_2 + 4\lambda_1$$

$$3x_0 + 2x_1 = 11$$

$$-2x_0 + 4x_1 = -2$$

$$6x_0 + 4x_1 = 22$$

$$-6x_0 + 12x_1 = -6$$

$$16x_1 = +16$$

$$x_1 = \underline{\underline{1}}$$

$$3x_0 + 2x_1 = 11$$

$$3x_0 + 2 = 11$$

$$x_0 = 9$$

$$x_0 = \underline{\underline{3}}$$

$$3x_0 + 2x_1 + x_2 = 9$$

$$x_0 = 3$$

$$2x_0 - x_1 + 2x_2 = 1$$

$$x_1 = 1$$

$$x_0 + x_1 - x_2 = 6$$

$$x_2 = -2$$

Standard form

$$3x_0 + 2x_1 + x_2 = 9$$

$$2x_0 - x_1 + 2x_2 = 1$$

$$x_0 + x_1 - x_2 = 6$$

$$\left[\begin{array}{ccc|c} 3 & 2 & 1 & 9 \\ 2 & -1 & 2 & 1 \\ 1 & 1 & -1 & 6 \end{array} \right]$$

Gaussian elimination to get upper right triangular form

$$\left[\begin{array}{ccc|c} \sim & \sim & \sim & \sim \\ 0 & \sim & \sim & \sim \\ 0 & 0 & \sim & \sim \end{array} \right]$$

$$\left[\begin{array}{ccc|c} 3 & 2 & 1 & 9 \\ 0 & -7/3 & 4/3 & -5 \\ 0 & 1/3 & -1/3 & 3 \end{array} \right]$$

$$r_2 = r_2 - \frac{2}{3}r_1$$

$$2 - \frac{2}{3} \cdot 3 =$$

$$1 - \frac{2}{3} \cdot 9 =$$

$$r_3 = r_3 - \frac{1}{3}r_1$$

$$= 1 - \frac{2}{3}$$

$$= \frac{1}{3}$$

$$6 - \frac{1}{3} \cdot 9$$

$$6 - 3 = 3$$

$$\left[\begin{array}{ccc|c} 3 & 2 & 1 & 9 \\ 0 & -7/3 & 4/3 & -5 \\ 0 & 1/3 & -4/3 & 3 \end{array} \right] \quad a_3 = a_3 - \underline{-1/7} a_2$$

$$\frac{1}{3} \bigg| -7/3$$

$$= -1/7$$

$$\left[\begin{array}{ccc|c} 3 & 2 & 1 & 9 \\ 0 & -7/3 & 4/3 & -5 \\ 0 & 0 & -\frac{24}{21} & \frac{16}{7} \end{array} \right] \quad \begin{aligned} & -\frac{4}{3} + \frac{1}{7} \cdot \frac{4}{3} \\ & -\frac{4}{3} + \frac{4}{21} \\ & = \frac{32}{21} \end{aligned}$$

$$3 - \frac{1.5}{7}$$

Back Substitution

$$0x_0 + 0x_1 + \left(\frac{-8}{7}\right)x_2 = \frac{16}{7}$$

$$\underline{\underline{x_2 = -2}}$$

$$0x_0 + \left(\frac{-7}{3}\right)x_1 + \left(\frac{8}{3}\right)x_2 = -5$$

$$\frac{-7}{3}x_1 = \frac{8}{3} = -5$$

$$x_1 = -\left(-5 + \frac{8}{3}\right) \cdot \frac{3}{7}$$

$$x_1 = -\left(\frac{-15 + 8}{3} \cdot \frac{3}{7}\right) = \underline{\underline{1}}$$

