Workrheet - ryrtem of linear Equations

1)

$$2x_1 + 4x_2 - x_3 = 52$$
$$-x_1 + 5x_2 + 3x_3 = 72$$
$$3x_1 - 7x_2 + 2x_3 = 10$$

$$2x_1 + 4x_2 - x_3 = 52$$
$$\underline{-2x_1 + 10x_2 + 6x_3 = 144}$$
$$14x_2 + 5x_3 = 196 \quad -\textcircled{6}$$

$$-\begin{array}{l} 3x_1 + 13x_2 + 9x_3 = 216 \\ \underline{3x_1 - 7x_2 + 2x_3 = 10} \\ 8x_2 + 11x_3 = 226 \quad -\textcircled{5} \end{array}$$

$$154x_2 + 55x_3 = 2156$$
$$\underline{40x_2 + 55x_3 = 1130}$$

$$\underline{ - - -}$$

$$114x_2 = 1026$$
$$x_2 = 9$$

$$72 + 11x_3 = 226$$
$$11x_3 = 226 - 72$$
$$11x_3 = 154$$
$$x_3 = 14$$

$$-x_1 + 45 + 42 = 72$$
$$-x_1 + 87 = 72$$
$$-x_1 = -15$$

$$\boxed{\begin{array}{l} x_1 = 15 \\ x_2 = 9 \\ x_3 = 14 \end{array}}$$

2)
$$11x_1 - x_2 - x_3 = 31 \quad -①$$
$$-x_1 + 6x_2 - 2x_3 = 26 \quad -②$$
$$-x_1 - 2x_2 + 7x_3 = 24 \quad -③$$

$$-x_1 + 6x_2 - 2x_3 = 26$$
$$-x_1 - 2x_2 + 7x_3 = 24$$
$$+ \quad\quad + \quad - \quad -$$
$$\overline{\quad\quad 8x_2 - 9x_3 = 2 \quad -④}$$

$$11x_1 - x_2 - x_3 = 31$$
$$-11x_1 + 66x_2 - 22x_3 = 286$$
$$\overline{\quad 65x_2 - 27x_3 = 317 \quad -⑤}$$

$$520x_2 - 207x_3 = 2536$$
$$520x_2 - 585x_3 = 130$$
$$- \quad\quad\quad +$$
$$\overline{\quad\quad 378x_3 = 2406}$$
$$x_3 = 6.365$$

$$\cancel{8x_2 - 9 \times 57.285 = 2} \qquad 8x_2 - 9 \times 6.365 = 2$$
$$\qquad\qquad\qquad\qquad 8x_2 - 57.285 = 2$$
$$\qquad\qquad\qquad\qquad 8x_2 = 59.285$$
$$\qquad\qquad\qquad\qquad x_2 = 7.41$$

$$\cancel{11x_1 =}$$
$$11x_1 - 7.41 - 6.365 = 31$$
$$11x_1 - 13.775 = 31$$
$$\therefore\ 11x_1 = 44.775$$

$$\boxed{\begin{array}{l} x_1 = 4.0705 \\ x_2 = 7.41 \\ x_3 = 6.36 \end{array}} \quad \text{Ans}$$

3)

$$2x_1 + 4x_2 - 3x_3 = 12 \quad —①$$
$$3x_1 - 5x_2 + 2x_3 = 13 \quad —②$$
$$-x_1 + 3x_2 + 2x_3 = 17 \quad —③$$

②×1 ③×3

$$3x_1 - 5x_2 + 2x_3 = 13$$
$$-3x_1 + 9x_2 + 6x_3 = 51$$
$$\overline{\qquad 4x_2 + 8x_3 = 64 \quad —④}$$

$$6x_1 + 12x_2 - 9x_3 = 36$$
$$6x_1 - 10x_2 + 4x_3 = 26$$
$$\begin{array}{ccc} - & + & - & * - \end{array}$$
$$\overline{\qquad 22x_2 - 13x_3 = 10 \quad —⑤}$$

$$88x_2 - 52x_3 = 40$$
$$88x_2 + 176x_3 = 1408$$
$$\overline{\qquad +228x_3 = +1368}$$
$$x_3 = 6$$

subtitut en ④

$$4x_2 + 8\cdot6 = 64$$
$$4x_2 + 48 = 64$$
$$4x_2 = 16$$
$$x_2 = 4$$

e substitub en ①

$$2x_1 + 4\times4 - 3\times6 = 12$$
$$2x_1 + 16 - 18 = 12$$
$$2x_1 - 2 = 12$$
$$2x_1 = 14$$

$$\boxed{\begin{array}{l} x_1 = 7 \\ x_2 = 4 \\ x_3 = 6 \end{array}}$$