Algebra

Applications of simultaneous linear equations

1. **Vinu bought 5 rulers, 7 ink pads and 3 pens at a cost of Rs. 52. Rosy bought 4 pens, 6 ink pads and 7 rulers for Rs.53 when Paul bought 7 pens and 3 ink pads, the shop keeper took a 50 rupee note from him and paid back the cost of 7 rulers. Find the cost of each.**

Solution:

Let the cost of 1 ruler, 1 ink pad and 1 pen be Rs.x, Rs.y. Rs.z respectively.

$5x + 7y + 3z = 52$ -----(1)

$7x + 6y + 4z = 53$ -----(2)

$3y + 7z = 50 - 7x$

$7x + 3y + 7z = 50$ -----(3)

(1) x 7 $\Rightarrow$ $35x + 49y + 21z = 364$

(2) x 5 $\Rightarrow$ $35x + 30y + 20z = 265$

$19y + z = 99$ -----(4)

(2) $\Rightarrow$ $7x + 6y + 4z = 53$

(3) $\Rightarrow$ $7x + 3y + 7z = 50$

$3y - 3z = 3$

$y - z = 1$ -----(5)

(4) $\Rightarrow$ $19y + z = 99$

(5) $\Rightarrow$ $y - z = 1$

$20y = 100$

$\boldsymbol{y = 5}$

From (5) $5 - z = 1$

$\boldsymbol{z = 4}$

From (1) $5x + 35 + 12 = 52$

$5x = 5$

$\boldsymbol{x = 1}$

$\therefore$ Cost of 1 ruler = Rs. 1

Cost of 1 ink pad = Rs. 5