

⑨ let digit at units place =  $x$   
digit at tens place =  $y$

$$\therefore \text{no.} = 10y + x$$

con. I

$$10y + x = 8(x + y) - 5$$

$$\Rightarrow 10y + x = 8x + 8y - 5$$

$$\Rightarrow 7x - 2y = 5 \dots \textcircled{i}$$

con II if  $x > y$

$$10y + x = 16(x - y) + 3$$

$$10y + x = 16x - 16y + 3$$

$$\Rightarrow 15x - 26y = -3 \dots \textcircled{ii}$$

if  $y > x$

$$10y + x = 16(y - x) + 3$$

$$10y + x = 16y - 16x + 3$$

$$17x - 6y = 3 \dots \textcircled{iii}$$

$$\textcircled{i} \times 3 - \textcircled{iii} \times 1$$

$$21x - 6y = 15$$

$$\underline{21x - 6y = 15}$$

$$\underline{17x - 6y = 3}$$

$$4x = 12$$

$$\Rightarrow x = 3$$

Sub ①

$$21 - 2y = 5$$

$$\Rightarrow 2y = 16$$

$$\Rightarrow y = 8$$

$$\therefore \text{no.} = 10 \times 8 + 3 = 83$$

$$\textcircled{i} \times 13 - \textcircled{ii} \times 1$$

$$91x - 26y = 65$$

$$\underline{15x - 26y = -3}$$

$$76x = 68$$

$$\Rightarrow x = \frac{68}{76}$$

rejected

$\therefore$  reqd no = 83

⑩ let full fare = ₹  $2x$   
half fare = ₹  $x$   
let reservation charges = ₹  $y$

$$\text{con I, } 2x + y = 2530 \dots \textcircled{i}$$

$$\text{con II } 2x + y + x + y = 3810$$

$$\Rightarrow 3x + 2y = 3810 \dots \textcircled{ii}$$

$$\textcircled{i} \times 2 - \textcircled{ii} \times 1$$

$$4x + 2y = 5060$$

$$\underline{3x + 2y = 3810}$$

$$x = 1250$$

Sub ①

$$2500 + y = 2530$$

$$\Rightarrow y = 30$$



Full fare = ₹ 2500  
res. charges = ₹ 30