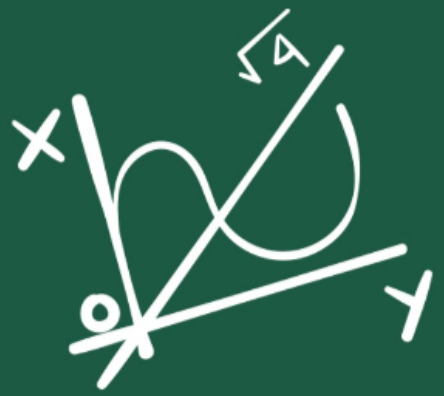
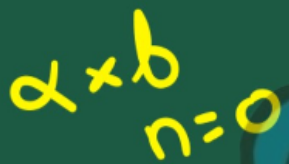
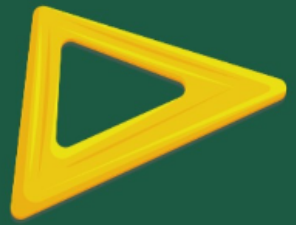
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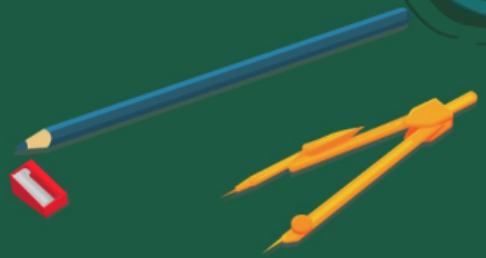
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দশম শ্ৰেণীৰ বাবে

গণিত

অধ্যায় - ৩

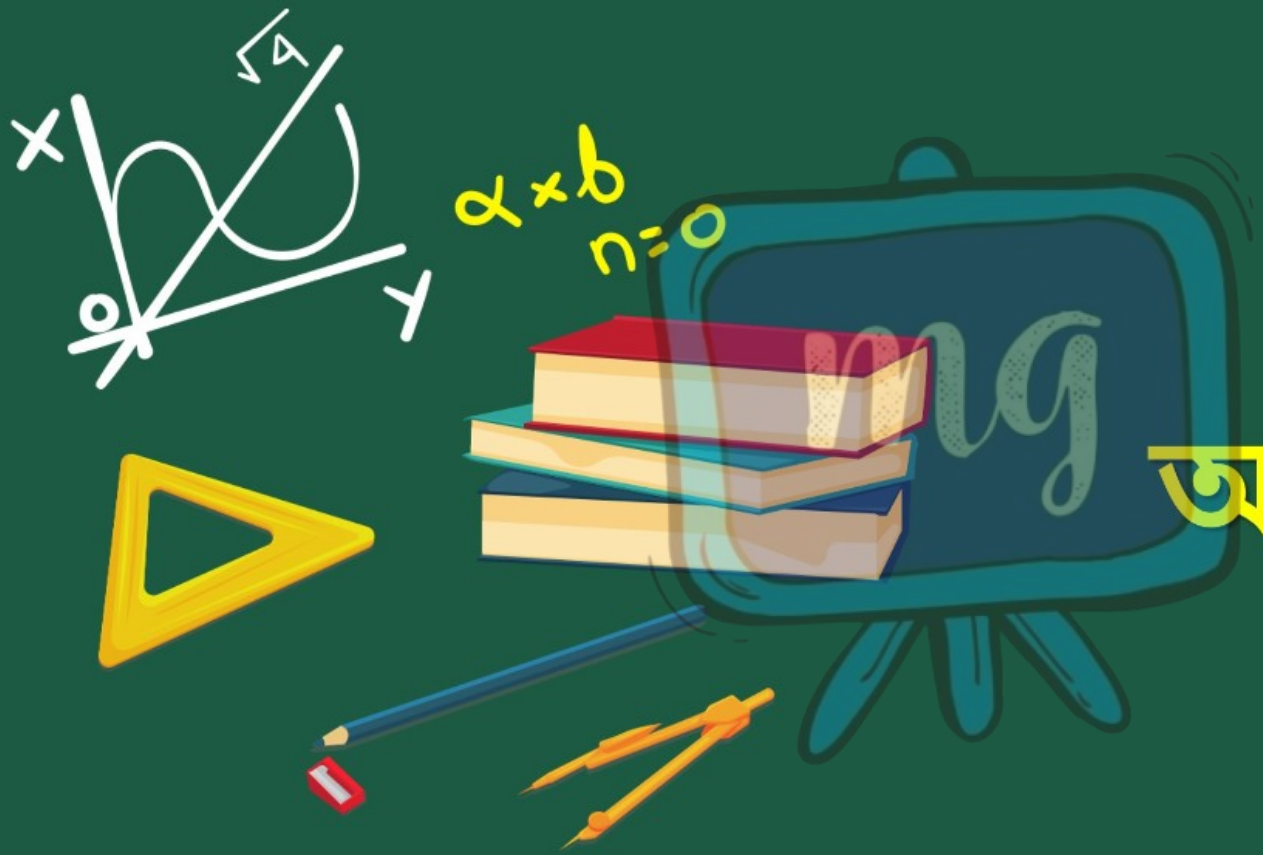
দুটা চলকত ৰৈখিক সমীকৰণৰ যোৰ

অংশ – ২৩

গায়ত্রী শইকীয়া

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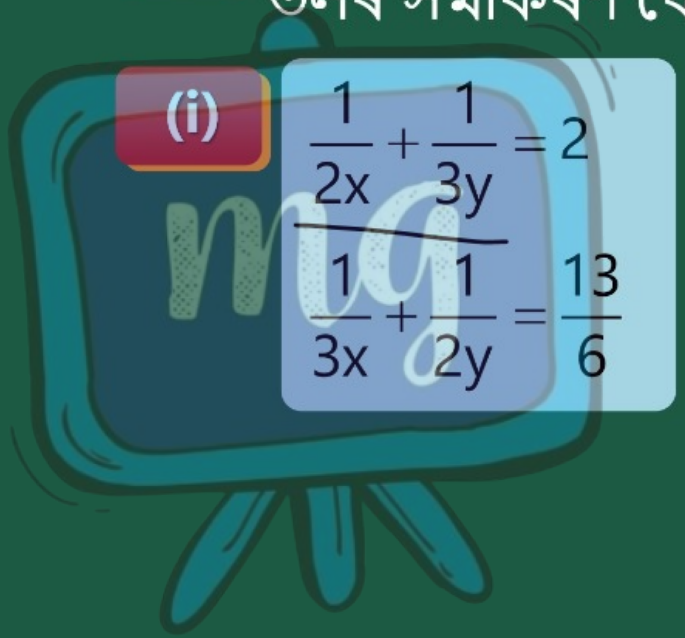


অনুশীলনী 3.6

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(i)

$$\frac{1}{2x} + \frac{1}{3y} = 2$$

$$\frac{1}{3x} + \frac{1}{2y} = \frac{13}{6}$$

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সমাধান:

$$\frac{1}{2x} + \frac{1}{3y} = 2$$

$$\Rightarrow \frac{1}{2}\cdot\frac{1}{x} + \frac{1}{3}\cdot\frac{1}{y} = 2 \quad \text{---(1)}$$

আবার

$$\frac{1}{3x} + \frac{1}{2y} = \frac{13}{6}$$

$$\Rightarrow \frac{1}{3}\cdot\frac{1}{x} + \frac{1}{2}\cdot\frac{1}{y} = \frac{13}{6} \quad \text{---(2)}$$

ধরো, $\frac{1}{x} = u$, $\frac{1}{y} = v$

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$\therefore$ (1) $\Rightarrow \frac{1}{2} \cdot u + \frac{1}{3} \cdot v = 2$

$\Rightarrow \frac{3u + 2v}{6} = 2$

$\Rightarrow 3u + 2v = 12$ ——— (3)

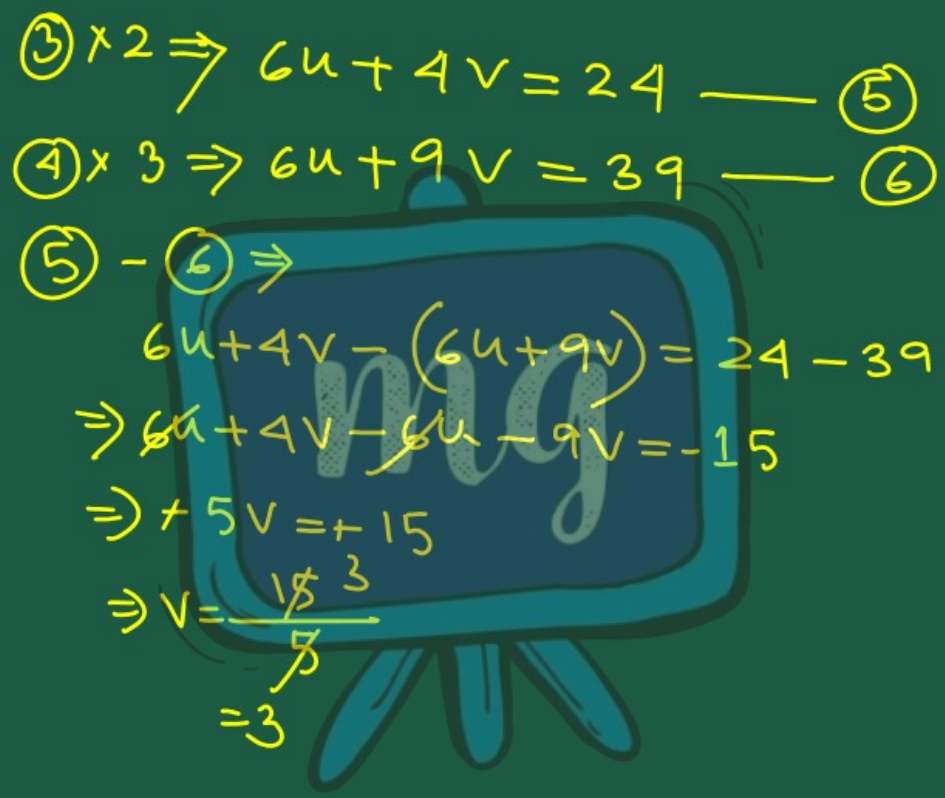
(2) $\Rightarrow \frac{1}{3} u + \frac{1}{2} v = \frac{13}{6}$

$\Rightarrow \frac{2u + 3v}{6} = \frac{13}{6}$

$\Rightarrow 2u + 3v = 13$ ——— (4)

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$③ \times 2 \Rightarrow 6u + 4v = 24$ —— ⑤

$④ \times 3 \Rightarrow 6u + 9v = 39$ —— ⑥

⑤ − ⑥ ⇒

$6u + 4v - (6u + 9v) = 24 - 39$

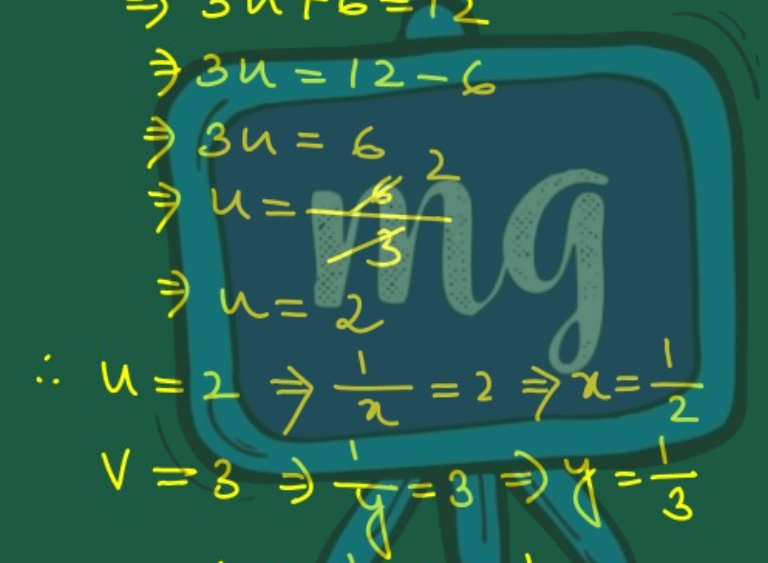
$\Rightarrow 6u + 4v - 6u - 9v = -15$

$\Rightarrow +5v = +15$

$\Rightarrow v = \frac{15}{5} = 3$

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③ $\Rightarrow 3u+2v=12$

$\Rightarrow 3u+2\cdot 3=12$

$\Rightarrow 3u+6=12$

$\Rightarrow 3u=12-6$

$\Rightarrow 3u=6$

$\Rightarrow u=\frac{6}{3}^{2}$

$\Rightarrow u=2$

$\therefore u=2 \Rightarrow \frac{1}{x}=2 \Rightarrow x=\frac{1}{2}$

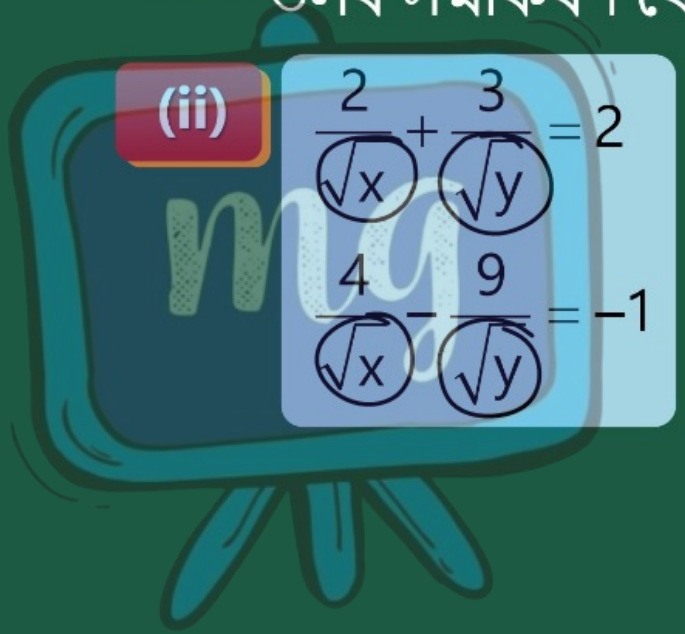
$v=3 \Rightarrow \frac{1}{y}=3 \Rightarrow y=\frac{1}{3}$

$\therefore x=\frac{1}{2}, y=\frac{1}{3}$ //

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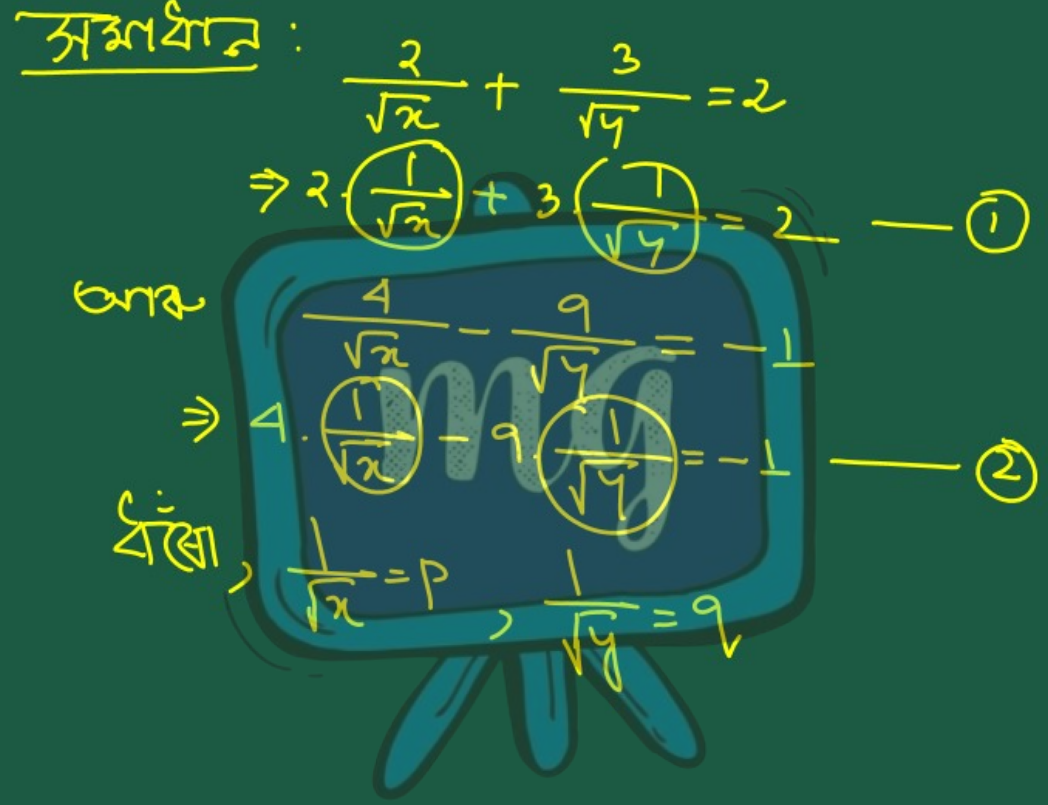
(ii)

$$\frac{2}{\sqrt{x}} + \frac{3}{\sqrt{y}} = 2$$

$$\frac{4}{\sqrt{x}} - \frac{9}{\sqrt{y}} = -1$$

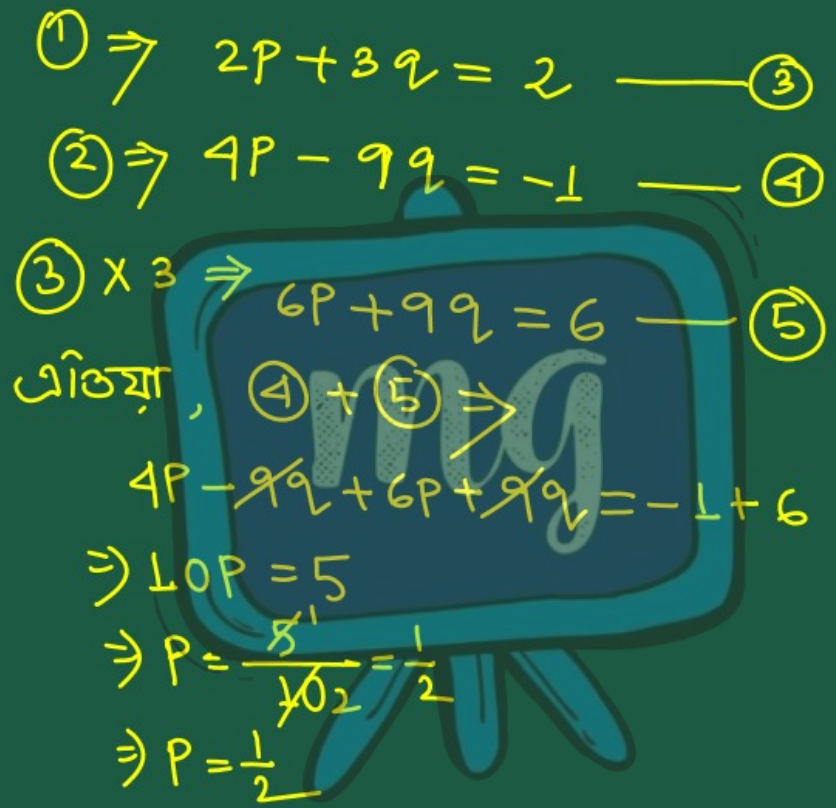
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① ⇒ $2p + 3q = 2$ —— ③

② ⇒ $4p - 9q = -1$ —— ④

③ × 3 ⇒ $6p + 9q = 6$ —— ⑤

এবার, ④ + ⑤ ⇒

$4p - 9q + 6p + 9q = -1 + 6$

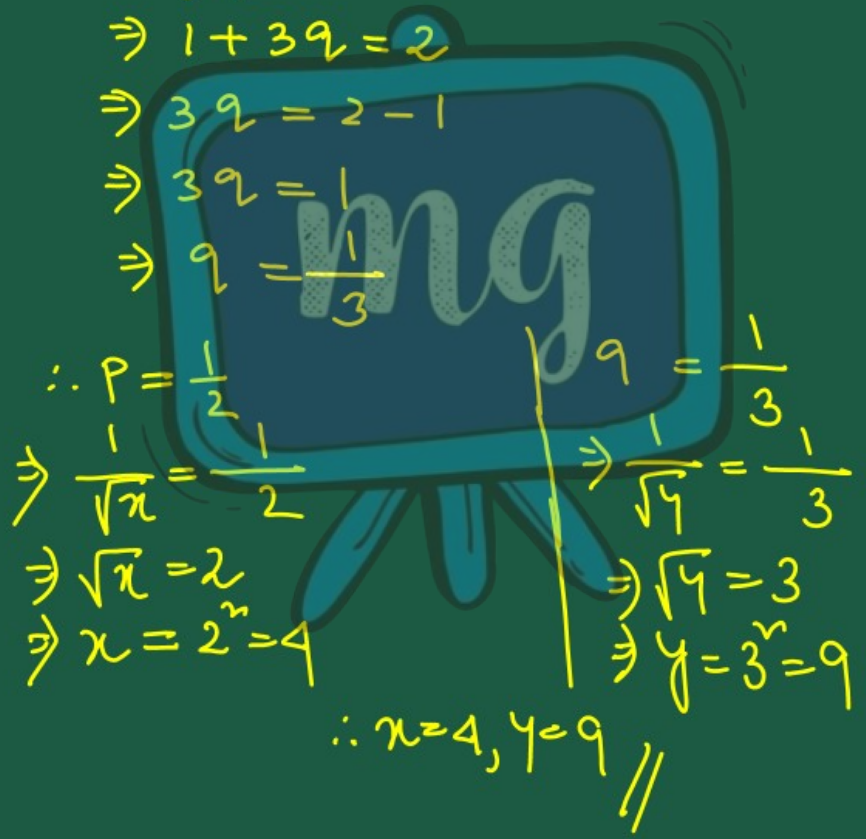
$\Rightarrow 10p = 5$

$\Rightarrow p = \frac{5^{1}}{10_{2}} = \frac{1}{2}$

$\Rightarrow p = \frac{1}{2}$

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③ $\Rightarrow 2p + 3q = 2$

$\Rightarrow x \cdot \frac{1}{x} + 3q = 2$

$\Rightarrow 1 + 3q = 2$

$\Rightarrow 3q = 2 - 1$

$\Rightarrow 3q = 1$

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

$\therefore p = \frac{1}{2}$

$\Rightarrow \frac{1}{\sqrt{x}} = \frac{1}{2}$

$\Rightarrow \sqrt{x} = 2$

$\Rightarrow x = 2^2 = 4$

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

$\Rightarrow \frac{1}{\sqrt{y}} = \frac{1}{3}$

$\Rightarrow \sqrt{y} = 3$

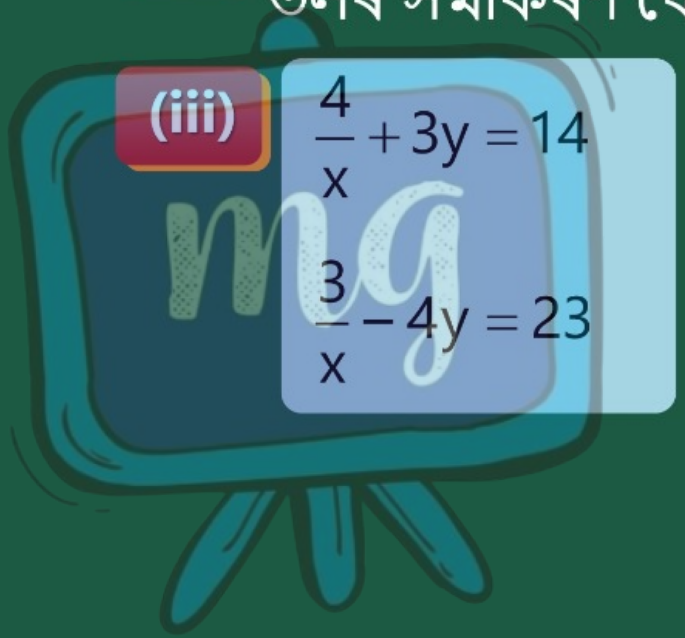
$\Rightarrow y = 3^2 = 9$

$\therefore x = 4, y = 9$ //

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(iii)

$$\frac{4}{x} + 3y = 14$$

$$\frac{3}{x} - 4y = 23$$

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সমাধান : $\frac{4}{x} + 3y = 14$

$\Rightarrow 4 \cdot \frac{1}{x} + 3y - 14 = 0$ ——— (1)

আবার $\frac{3}{x} - 4y = 23$

$\Rightarrow 3 \cdot \frac{1}{x} - 4y - 23 = 0$ ——— (2)

ধরি, $\frac{1}{x} = u$

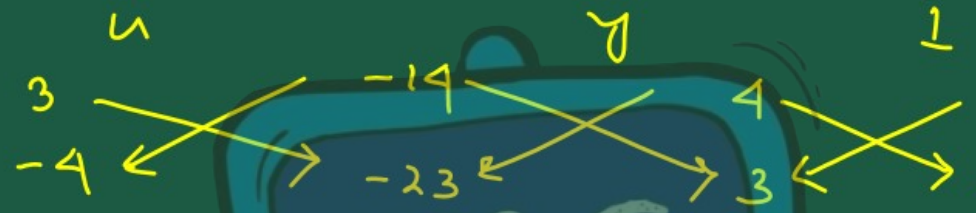
$\therefore$ (1) $\Rightarrow 4u + 3y - 14 = 0$

(2) $\Rightarrow 3u - 4y - 23 = 0$

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$$4x + 3y - 14 = 0$$
$$3x - 4y - 23 = 0$$



ಅಥವಾ $\frac{x}{3.(-23) - (-14).(-4)} = \frac{y}{(-14).3 - 4.(-23)} = \frac{1}{4.(-4) - 3.3}$

ಅಥವಾ $\frac{x}{-69 - 56} = \frac{y}{-42 + 92} = \frac{1}{-16 - 9}$

ಅಥವಾ $\frac{x}{-125} = \frac{y}{50} = \frac{1}{-25}$

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এখানে $\frac{u}{-125} = \frac{1}{-25}$

$\Rightarrow u = \frac{-125}{-25} = 5$

$\Rightarrow u = 5$

$\Rightarrow \frac{1}{x} = 5$

$\Rightarrow x = \frac{1}{5}$

আবার, $\frac{v}{50} = \frac{1}{-25}$

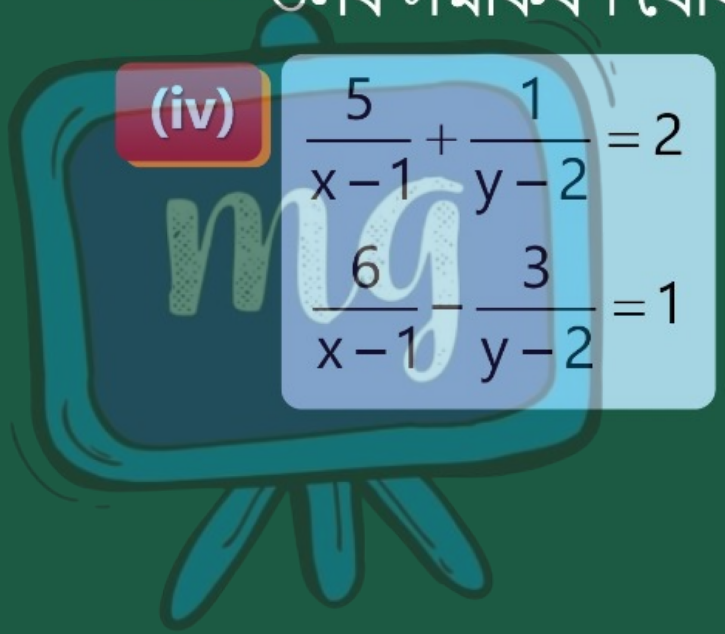
$\Rightarrow v = \frac{50}{-25} = -2$

$\therefore x = \frac{1}{5}, y = -2$ //

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(iv)

$$\frac{5}{x-1}+\frac{1}{y-2}=2$$

$$\frac{6}{x-1}-\frac{3}{y-2}=1$$

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সমাধান :

$$\frac{5}{x-1} + \frac{1}{y-2} = 2 \quad \text{—①}$$

$$\frac{6}{x-1} - \frac{3}{y-2} = 1 \quad \text{—②}$$

ধরি, $\frac{1}{x-1} = u$, $\frac{1}{y-2} = v$

∴ ① $\Rightarrow 5u + v - 2 = 0$ —③

② $\Rightarrow 6u - 3v - 1 = 0$ —④

③ × 3 $\Rightarrow 15u + 3v - 6 = 0$ —⑤

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④ + ⑤ ⇒

$6u - 3v - 1 + 15u + 3v - 6 = 0$

$\Rightarrow 21u - 7 = 0$

$\Rightarrow 21u = 7$

$\Rightarrow u = \frac{7}{21} = \frac{1}{3}$

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

$\therefore$ ③ $\Rightarrow 5u + v - 2 = 0$

$\Rightarrow 5 \cdot \frac{1}{3} + v - 2 = 0$

$\Rightarrow \frac{5}{3} - 2 + v = 0$

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$$\Rightarrow \frac{5-6}{3} + v = 0$$

$$\Rightarrow \frac{-1}{3} + v = 0$$

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

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

$$\Rightarrow \frac{1}{x-1} = \frac{1}{3}$$

$$\Rightarrow x - 1 = 3$$

$$\Rightarrow x = 3 + 1$$

$$\Rightarrow x = 4$$

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

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

$$\Rightarrow y - 2 = 3$$

$$\Rightarrow y = 3 + 2$$

$$\Rightarrow y = 5$$

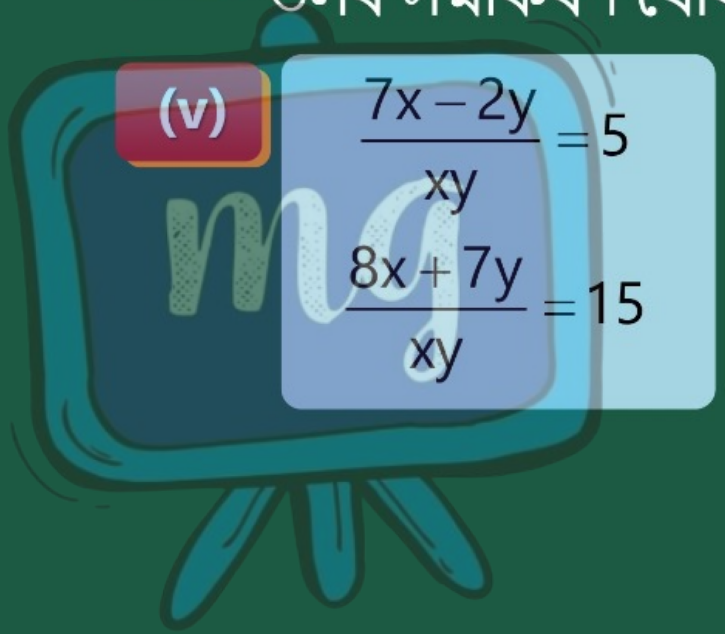
$$\therefore x = 4, y = 5$$

//

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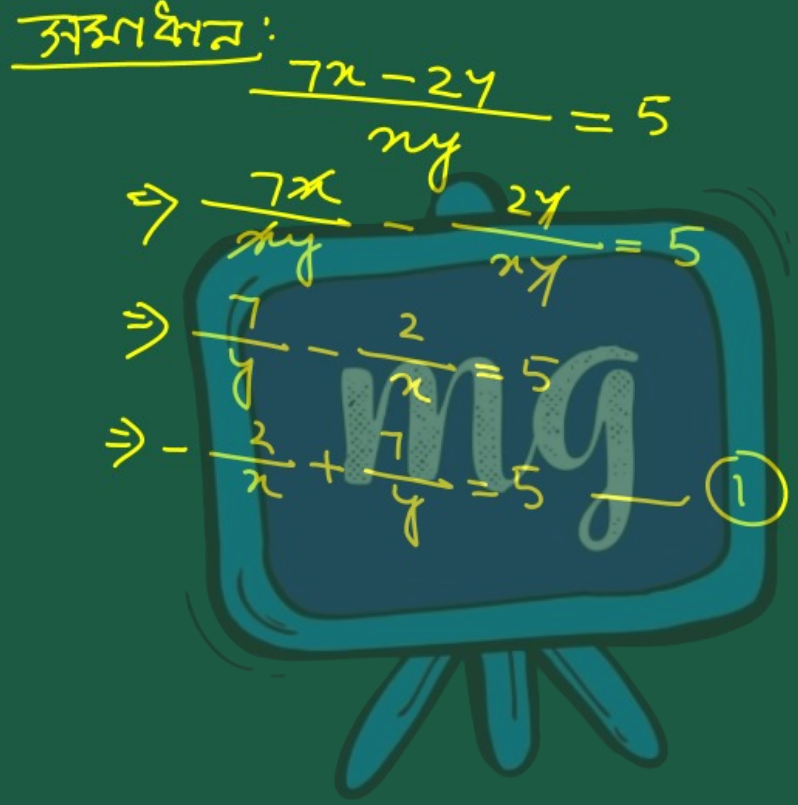
(v)

$$\frac{7x-2y}{xy}=5$$

$$\frac{8x+7y}{xy}=15$$

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$$\frac{8x+7y}{xy}=15$$

$$\Rightarrow \frac{8x}{xy}+\frac{7y}{xy}=15$$

$$\Rightarrow \frac{8}{y}+\frac{7}{x}=15$$

$$\Rightarrow \frac{7}{x}+\frac{8}{y}=15 \quad \text{---} (2)$$

ধরো, $\frac{1}{x}=u$, $\frac{1}{y}=v$

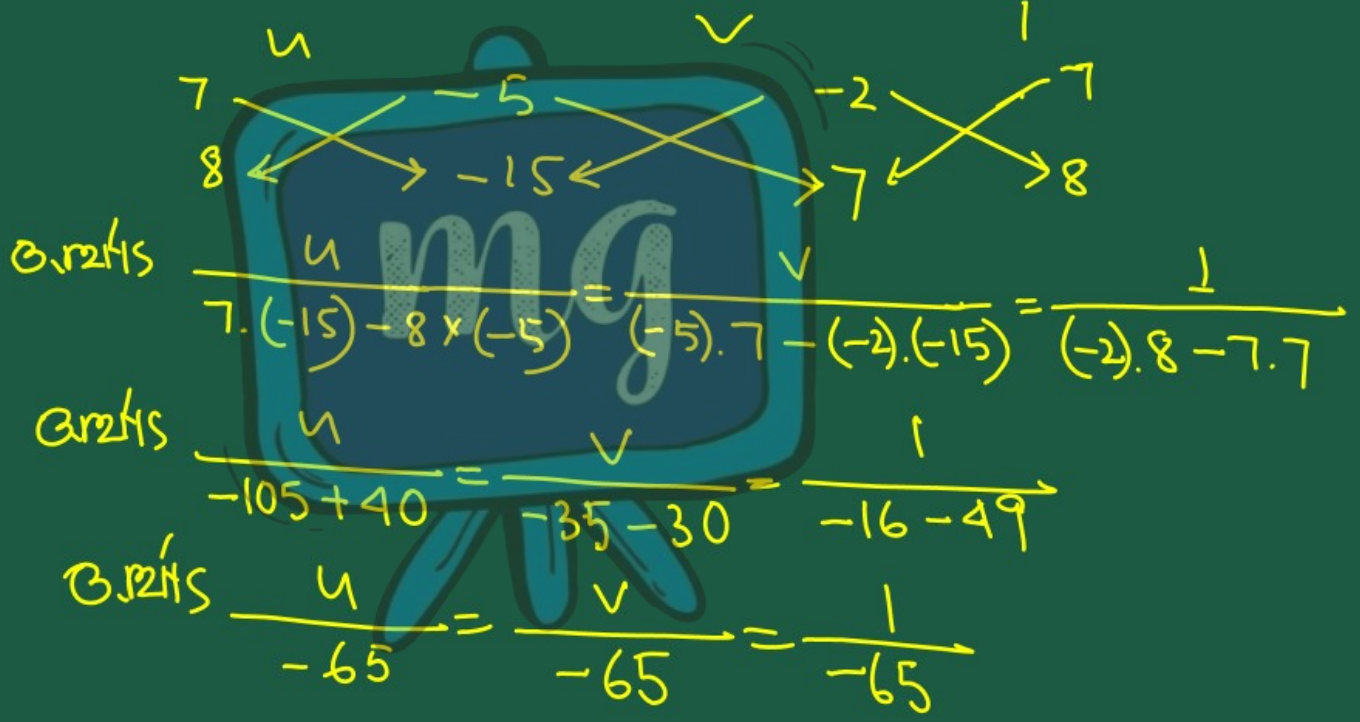
$\therefore$ (1) $\Rightarrow -2u+7v-5=0$

(2) $\Rightarrow 7u+8v-15=0$

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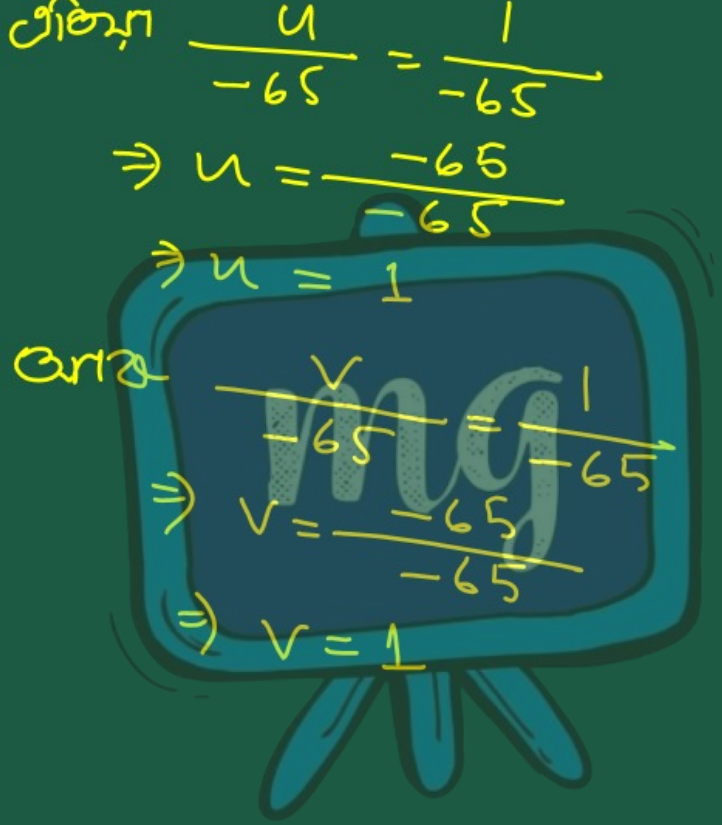
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$$-2u + 7v - 5 = 0$$
$$7u + 8v - 15 = 0$$



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$\therefore u = 1$

$\Rightarrow \frac{1}{x} = 1$

$\Rightarrow x = 1$

Also $v = 1$

$\Rightarrow \frac{1}{y} = 1$

$\Rightarrow y = 1$

$\therefore x = 1, y = 1$ //

