

Exercise - 1(a)

Handwritten Solution

ସତ୍ତ୍ୱ ସଦ୍‌ସମୀକ୍ତିତ୍ୱ

ePathchala

Ritesh

Exercise - 1(a) Solutions

1. ବନ୍ଧନୀ ମଧ୍ୟରୁ ଠିକ୍ ଉତ୍ତରଟି ବାଛି ଶୂନ୍ୟସ୍ଥାନ ପୂରଣ କର ।

- (i) $x + y = 0$ ସମୀକରଣ ର ଅନ୍ୟତମ ସମାଧାନ ----- $[(4,5), (5,5), (-4, 4), (-4, 5)]$
- (ii) $x - 2y = 0$ ସମୀକରଣର ଅନ୍ୟତମ ସମାଧାନ ----- $[(4,2), (-4,2), (4, -2), (-4, -2)]$
- (iii) $2x + y + 2 = 0$ ସମୀକରଣର ଅନ୍ୟତମ ସମାଧାନ ----- $[(0,2), (2,0), (-2,0), (0, -2)]$
- (iv) $x - 4y + 1 = 0$ ହେଲେ $x =$ ----- $[4y - 1, 4y + 1, -4y + 1, -4y - 1]$
- (v) $2x - y + 2 = 0$ ହେଲେ $y =$ ----- $[2x - 2, 2x + 2, 2x - 2, -2x - 2]$
- (vi) $x - 2y + 3 = 0$ ହେଲେ $y =$ ----- $[\frac{1}{2}(x+3), -\frac{1}{2}(x-3), -\frac{1}{2}(-x+3), -\frac{1}{2}(x+3)]$

Correct Ans: (i) $(-4, 4)$

(ii) $(4, 2)$

(iii) $(0, -2)$

(iv) $x - 4y + 1 = 0 \Rightarrow x = 4y - 1$

(v) $2x - y + 2 = 0 \Rightarrow y = 2x + 2$

(vi) $x - 2y + 3 = 0 \Rightarrow 2y = x + 3 \Rightarrow y = \frac{1}{2}(x + 3)$

ଯଦି (a, b) ସମୀକରଣର ସମାଧାନ ହେବେ $x = a, y = b$

ତେଲେ ସମୀକରଣଟି ସତ୍ୟ ହେଉଥିବ ।

2. ନିମ୍ନରେ ଦତ୍ତ ସହସମୀକରଣ ଯୋଡ଼ିରୁ କେଉଁ ସମୀକରଣ ଯୋଡ଼ି କ୍ଷେତ୍ରରେ (i) ଅନନ୍ୟ ସମାଧାନ ସମ୍ଭବ (ii) ଅସଂଖ୍ୟ ସମାଧାନ ସମ୍ଭବ ଏବଂ (iii) ସମାଧାନ ସମ୍ଭବ ନୁହେଁ ?

(i) $x+y+1=0$, $x-y+1=0$,

(ii) $x+y+1=0$, $2x+2y+2=0$

(iii) $x+y+1=0$, $x+y+3=0$,

(iv) $2x-y+3=0$, $-4x+2y-6=0$

(v) $2x-y+3=0$, $2x+y-3=0$,

(vi) $2x-y+3=0$, $-6x+3y+5=0$

check

which
condition

is holding

there

(i) $x+y+1=0$, $x-y+1=0$ $a_1=1$ $b_1=1$ $c_1=1$
 $a_2=1$ $b_2=-1$ $c_2=1$

$\frac{a_1}{a_2} = 1$, $\frac{b_1}{b_2} = -1$, $\frac{c_1}{c_2} = 1$

$\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$ [ଅନନ୍ୟ ସମାଧାନ]

(ii) $x+y+1=0$, $2x+2y+2=0$ $a_1=1$ $b_1=1$ $c_1=1$
 $a_2=2$ $b_2=2$ $c_2=2$

$\frac{a_1}{a_2} = \frac{1}{2}$, $\frac{b_1}{b_2} = \frac{1}{2}$, $\frac{c_1}{c_2} = \frac{1}{2}$

$\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$ [ଅସଂଖ୍ୟ ସମାଧାନ]

(iii) $x+y+1=0$, $x+y+3=0$ $a_1=1$ $b_1=1$ $c_1=1$
 $a_2=1$ $b_2=1$ $c_2=3$

$\frac{a_1}{a_2} = 1$ $\frac{b_1}{b_2} = 1$ $\frac{c_1}{c_2} = \frac{1}{3}$

$\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$ [ସମାଧାନ ଅସମ୍ଭବ]

(i) $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$ (ଅନନ୍ୟ ସମାଧାନ) (ii) $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$

(iii) $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$ (ସମାଧାନ ଅସମ୍ଭବ) (ଅସଂଖ୍ୟ ସମାଧାନ)

2. ନିମ୍ନରେ ଦତ୍ତ ସହସମୀକରଣ ଯୋଡ଼ିରୁ କେଉଁ ସମୀକରଣ ଯୋଡ଼ି କ୍ଷେତ୍ରରେ (i) ଅନନ୍ୟ ସମାଧାନ ସମ୍ଭବ (ii) ଅସଂଖ୍ୟ ସମାଧାନ ସମ୍ଭବ ଏବଂ (iii) ସମାଧାନ ସମ୍ଭବ ନୁହେଁ ?

(i) $x+y+1=0$, $x-y+1=0$,

(ii) $x+y+1=0$, $2x+2y+2=0$

(iii) $x+y+1=0$, $x+y+3=0$,

(iv) $2x-y+3=0$, $-4x+2y-6=0$

(v) $2x-y+3=0$, $2x+y-3=0$,

(vi) $2x-y+3=0$, $-6x+3y+5=0$

(iv) $2x-y+3=0$, $-4x+2y-6=0$ $a_1=2$ $b_1=-1$ $c_1=3$
 $a_2=-4$ $b_2=2$ $c_2=-6$

$\frac{a_1}{a_2} = \frac{2}{-4} = -\frac{1}{2}$ $\frac{b_1}{b_2} = \frac{-1}{2}$ $\frac{c_1}{c_2} = \frac{3}{-6} = -\frac{1}{2}$

$\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$ [ଅସଂଖ୍ୟ ସମାଧାନ]

(v) $2x-y+3=0$, $2x+y-3=0$ $a_1=2$ $b_1=-1$ $c_1=3$
 $a_2=2$ $b_2=1$ $c_2=-3$

$\frac{a_1}{a_2} = \frac{2}{2} = 1$ $\frac{b_1}{b_2} = \frac{-1}{1} = -1$ $\frac{c_1}{c_2} = \frac{3}{-3} = -1$

$\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$ [ଅନନ୍ୟ ସମାଧାନ]

(vi) $2x-y+3=0$, $-6x+3y+5=0$ $a_1=2$ $b_1=-1$ $c_1=3$
 $a_2=-6$ $b_2=3$ $c_2=5$

$\frac{a_1}{a_2} = \frac{2}{-6} = -\frac{1}{3}$ $\frac{b_1}{b_2} = \frac{-1}{3}$ $\frac{c_1}{c_2} = \frac{3}{5}$

$\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$ [ସମାଧାନ ଅସମ୍ଭବ]

(i) $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$ (ଅନନ୍ୟ ସମାଧାନ) (ii) $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$

(iii) $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$ (ସମାଧାନ ଅସମ୍ଭବ) (ଅସଂଖ୍ୟ ସମାଧାନ)

3. ନିମ୍ନଲିଖିତ ସମୀକରଣଗୁଡ଼ିକର ଲେଖଚିତ୍ର ଅଙ୍କନ ପାଇଁ ଯେ କୌଣସି ତିନିଗୋଟି ବିନ୍ଦୁର ସ୍ଥାନାଙ୍କ ନିରୂପଣ କର ।

(i) $x - y = 0$

(ii) $x + y = 0$

(iii) $x - 2y = 0$

(iv) $x + 2y - 4 = 0$

(v) $x - 2y - 4 = 0$

(vi) $2x - y + 4 = 0$

(i) $x - y = 0 \Rightarrow y = x$ for $x = 0$ $x = 1$ $x = 2$
 $y = 0$ $y = 1$ $y = 2$
 $(0,0)$ $(1,1)$ $(2,2)$

(ii) $x + y = 0 \Rightarrow y = -x$ for $x = 0$ $x = 1$ $x = 2$
 $y = 0$ $y = -1$ $y = -2$
 $(0,0)$ $(1,-1)$ $(2,-2)$

(iii) $x - 2y = 0 \Rightarrow y = \frac{x}{2}$ for $x = 0$ $x = 2$ $x = 4$
 $y = 0$ $y = 1$ $y = 2$
 $(0,0)$ $(2,1)$ $(4,2)$

(iv) $x + 2y - 4 = 0 \Rightarrow y = \frac{-x-4}{2}$
 for $x = 0$ $y = \frac{-4}{2} = -2$ $(0,-2)$
 $x = 1$ $y = \frac{-1-4}{2} = \frac{-5}{2}$ $(1, \frac{-5}{2})$
 $x = -1$ $y = \frac{-(-1)-4}{2} = \frac{1-4}{2} = \frac{-3}{2}$ $(-1, \frac{-3}{2})$

3. ନିମ୍ନଲିଖିତ ସମୀକରଣଗୁଡ଼ିକର ଲେଖାଚିତ୍ର ଅଙ୍କନ ପାଇଁ ଯେ କୌଣସି ତିନିଗୋଟି ବିନ୍ଦୁର ସ୍ଥାନାଙ୍କ ନିରୂପଣ କର ।

(i) $x - y = 0$

(ii) $x + y = 0$

(iii) $x - 2y = 0$

(iv) $x + 2y - 4 = 0$

(v) $x - 2y - 4 = 0$

(vi) $2x - y + 4 = 0$

(v) $x - 2y - 4 = 0 \Rightarrow y = \frac{x-4}{2}$

$x = 0 \quad y = \frac{-4}{2} = -2 \quad (0, -2)$

$x = 1 \quad y = \frac{1-4}{2} = \frac{-3}{2} \quad (1, -\frac{3}{2})$

$x = 2 \quad y = \frac{2-4}{2} = \frac{-2}{2} = -1 \quad (2, -1)$

(vi) $2x - y + 4 = 0 \Rightarrow y = 2x + 4$

$x = 0 \quad y = 4 \quad (0, 4)$

$x = 1 \quad y = 2 + 4 = 6 \quad (1, 6)$

$x = -1 \quad y = -2 + 4 = 2 \quad (-1, 2)$

4. ନିମ୍ନଲିଖିତ ପ୍ରଶ୍ନଗୁଡ଼ିକର ସଂକ୍ଷିପ୍ତ ଉତ୍ତର ଆବଶ୍ୟକ ।

(i) $kx + my + 4 = 0$ ଓ $2x + y + 1 = 0$ ସମାକରଣଦ୍ୱୟ ଅସଂଗତ ହେଲେ $k : m$ କେତେ ?

(ii) $2x + 3y - 5 = 0$ ଓ $7x - 6y - 1 = 0$ ସହସମାକରଣଦ୍ୱୟର ସମାଧାନ $(1, \beta)$ ହେଲେ β ର ମୂଲ୍ୟ କେତେ ?

(iii) 't' ର କେଉଁ ମାନ ପାଇଁ $(1, 1)$, ସମାକରଣ $3x + ty - 6 = 0$ ଅନ୍ୟ ଏକ ସମାଧାନ ହେବ ?

(i) $kx + my + 4 = 0$ ଓ $2x + y + 1 = 0$

ଅସଂଗତ $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$

$$\begin{array}{lll} a_1 = k & b_1 = m & c_1 = 4 \\ a_2 = 2 & b_2 = 1 & c_2 = 1 \end{array} \quad \frac{k}{2} = \frac{m}{1} \neq \frac{4}{1}$$

$$\Rightarrow k : m = 2 : 1 \text{ (Ans)}$$

(ii) $2x + 3y - 5 = 0$ ଓ $7x - 6y - 1 = 0$ ସମୀକରଣଦ୍ୱୟର
ସମାଧାନ $(1, \beta)$ $x = 1$ $y = \beta$

$$\begin{aligned} 2 \times 1 + 3\beta - 5 &= 0 \Rightarrow 2 + 3\beta - 5 = 0 \\ &\Rightarrow 3\beta = 5 - 2 = 3 \\ &\Rightarrow \beta = 1 \text{ (Ans)} \end{aligned}$$

(iii) $3x + ty - 6 = 0$ ର ସମାଧାନ $(1, 1)$ $x = 1$ ଓ $y = 1$

$$3 + t - 6 = 0 \Rightarrow t = 6 - 3 = 3 \text{ (Ans)}$$

(iv) 't' ର କେଉଁ ମାନ ପାଇଁ $(1,1)$, $tx - 2y - 10 = 0$ ର ଅନ୍ୟତମ ସମାଧାନ ହେବ ?

(v) 't' ର କେଉଁ ମାନ ପାଇଁ $tx + 2y = 0$ ଓ $3x + ty = 0$ ସହସମାକରଣଦ୍ୱାରା ଅସଂଖ୍ୟ ସମାଧାନ ସମ୍ଭବ ?

(vi) ଦର୍ଶାଅ ଯେ, $6x - 3y + 10 = 0$ ଓ $2x - y + 9 = 0$ ସହସମାକରଣଦ୍ୱାରା ସମାଧାନ ଅସମ୍ଭବ ।

(vii) ଦର୍ଶାଅ ଯେ, $2x + 5y = 17$ ଏବଂ $5x + 3y = 14$ ସହସମାକରଣଦ୍ୱାରା ସଂଗତ ଓ ସ୍ୱତନ୍ତ୍ର ।

(viii) ଦର୍ଶାଅ ଯେ, $3x - 5y - 10 = 0$ ଏବଂ $6x - 10y = 20$ ସହସମାକରଣଦ୍ୱାରା ଅସଂଖ୍ୟ ସମାଧାନ ରହିଛି ।

(iv) $tx - 2y - 10 = 0$ ରୁ ସମାଧାନ $(1,1)$ $x=1$ $y=1$

$$t - 2 - 10 = 0 \Rightarrow t = 10 + 2 = 12 \text{ (Ans)}$$

(v) $tx + 2y = 0$ ଓ $3x + ty = 0$ ସମୀକରଣର ଅସଂଖ୍ୟ ସମାଧାନ

$$\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2} \quad \text{ହେଉ} \quad \begin{matrix} a_1 = t & b_1 = 2 \\ a_2 = 3 & b_2 = t \end{matrix}$$

$$\frac{a_1}{a_2} = \frac{t}{3} \quad \frac{b_1}{b_2} = \frac{2}{t} \Rightarrow \frac{t}{3} = \frac{2}{t} \Rightarrow t^2 = 6 \Rightarrow t = \pm\sqrt{6}$$

(vi) $6x - 3y + 10 = 0$ $a_1 = 6$ $b_1 = -3$ $c_1 = 10$
 $2x - y + 9 = 0$ $a_2 = 2$ $b_2 = -1$ $c_2 = 9$

ଅସମ୍ଭବ ସମାଧାନ $\frac{a_1}{a_2} \neq \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$
 $\frac{6}{2} = \frac{-3}{-1} \neq \frac{10}{9} \Rightarrow 3 \neq 3 \neq \frac{10}{9} \text{ (Proved)}$

(iv) 't' ର କେଉଁ ମାନ ପାଇଁ $(1,1)$, $tx - 2y - 10 = 0$ ର ଅନ୍ୟତମ ସମାଧାନ ହେବ ?

(v) 't' ର କେଉଁ ମାନ ପାଇଁ $tx + 2y = 0$ ଓ $3x + ty = 0$ ସହସମାକରଣଦ୍ୱାରା ଅସଂଖ୍ୟ ସମାଧାନ ସମ୍ଭବ ?

(vi) ଦର୍ଶାଅ ଯେ, $6x - 3y + 10 = 0$ ଓ $2x - y + 9 = 0$ ସହସମାକରଣଦ୍ୱାରା ସମାଧାନ ଅସମ୍ଭବ ।

(vii) ଦର୍ଶାଅ ଯେ, $2x + 5y = 17$ ଏବଂ $5x + 3y = 14$ ସହସମାକରଣଦ୍ୱାରା ସଂଗତ ଓ ସ୍ୱତନ୍ତ୍ର ।

(viii) ଦର୍ଶାଅ ଯେ, $3x - 5y - 10 = 0$ ଏବଂ $6x - 10y = 20$ ସହସମାକରଣଦ୍ୱାରା ଅସଂଖ୍ୟ ସମାଧାନ ରହିଛି ।

(vii) $2x + 5y = 17$ $a_1 = 2$ $b_1 = 5$ $c_1 = -17$
 $5x + 3y = 14$ $a_2 = 5$ $b_2 = 3$ $c_2 = -14$

ସହସମାକରଣଦ୍ୱାରା ସଂଗତ ଓ ସ୍ୱତନ୍ତ୍ର : $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$

$$\frac{2}{5} \neq \frac{5}{3} \text{ (proved)}$$

(viii) $3x - 5y - 10 = 0$ $a_1 = 3$ $b_1 = -5$ $c_1 = -10$
 $6x - 10y - 20 = 0$ $a_2 = 6$ $b_2 = -10$ $c_2 = -20$

ଅସଂଖ୍ୟ ସମାଧାନ : $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$

$$\frac{3}{6} = \frac{-5}{-10} = \frac{-10}{-20} \Rightarrow \frac{1}{2} = \frac{1}{2} = \frac{1}{2}$$

7. ନିମ୍ନରେ ପ୍ରଦତ୍ତ ସହସମୀକରଣ ଦ୍ଵୟର ଅନନ୍ୟ ସମାଧାନ ସମ୍ଭବ ହେଲେ ପ୍ରତ୍ୟେକ କ୍ଷେତ୍ରରେ k ର ମାନ ସ୍ଥିର କର ।

(i) $x - 2y - 3 = 0$, $3x + ky - 1 = 0$,

(ii) $kx - y - 2 = 0$, $6x + 2y - 3 = 0$

(iii) $kx + 3y + 8 = 0$, $12x + 5y - 2 = 0$,

(iv) $kx + 2y = 5$, $3x + y = 1$

(v) $x - ky = 2$, $3x + 2y + 5 = 0$,

(vi) $4x - ky = 5$, $2x - 3y = 12$

ଅନନ୍ୟ ସମାଧାନ : $a_1/a_2 \neq b_1/b_2$

(i) $x - 2y - 3 = 0$ $a_1 = 1$ $b_1 = -2$ $\frac{a_1}{a_2} = \frac{1}{3}, \frac{b_1}{b_2} = -\frac{2}{k}$
 $3x + ky - 1 = 0$ $a_2 = 3$ $b_2 = k$

$$\frac{a_1}{a_2} \neq \frac{b_1}{b_2} \Rightarrow \frac{1}{3} \neq -\frac{2}{k} \Rightarrow \boxed{k \neq -6}$$

(ii) $kx - y - 2 = 0$ $a_1 = k$ $b_1 = -1$ $\frac{a_1}{a_2} = \frac{k}{6}$ & $\frac{b_1}{b_2} = -\frac{1}{2}$
 $6x + 2y - 3 = 0$ $a_2 = 6$ $b_2 = 2$

$$\frac{a_1}{a_2} \neq \frac{b_1}{b_2} \Rightarrow \frac{k}{6} \neq -\frac{1}{2} \Rightarrow \boxed{k \neq -3}$$

(iii) $kx + 3y + 8 = 0$ $a_1 = k$ $b_1 = 3$ $\frac{a_1}{a_2} = \frac{k}{12}$ & $\frac{b_1}{b_2} = \frac{3}{5}$
 $12x + 5y - 2 = 0$ $a_2 = 12$ $b_2 = 5$

$$\frac{a_1}{a_2} \neq \frac{b_1}{b_2} \Rightarrow \frac{k}{12} \neq \frac{3}{5} \Rightarrow \boxed{k \neq \frac{36}{5}}$$

7. ନିମ୍ନରେ ପ୍ରଦତ୍ତ ସହସମୀକରଣ ଦ୍ଵୟର ଅନନ୍ୟ ସମାଧାନ ସମ୍ଭବ ହେଲେ ପ୍ରତ୍ୟେକ କ୍ଷେତ୍ରରେ k ର ମାନ ସ୍ଥିର କର ।

(i) $x - 2y - 3 = 0$, $3x + ky - 1 = 0$,

(ii) $kx - y - 2 = 0$, $6x + 2y - 3 = 0$

(iii) $kx + 3y + 8 = 0$, $12x + 5y - 2 = 0$,

(iv) $kx + 2y = 5$, $3x + y = 1$

(v) $x - ky = 2$, $3x + 2y + 5 = 0$,

(vi) $4x - ky = 5$, $2x - 3y = 12$

ଅନନ୍ୟ ସମାଧାନ : $a_1/a_2 \neq b_1/b_2$

(iv) $kx + 2y = 5$ $3x + y = 1$

$$\begin{array}{cc} a_1 = k & b_1 = 2 \\ a_2 = 3 & b_2 = 1 \end{array} \quad \frac{a_1}{a_2} = \frac{k}{3} \quad \& \quad \frac{b_1}{b_2} = \frac{2}{1}$$

$$\frac{k}{3} \neq \frac{2}{1} \Rightarrow \boxed{k \neq 6}$$

(v) $x - ky = 2$ $3x + 2y + 5 = 0$

$$\begin{array}{cc} a_1 = 1 & b_1 = -k \\ a_2 = 3 & b_2 = 2 \end{array} \quad \frac{a_1}{a_2} = \frac{1}{3} \quad \& \quad \frac{b_1}{b_2} = \frac{-k}{2}$$

$$\frac{1}{3} \neq \frac{-k}{2} \Rightarrow \boxed{k = -\frac{2}{3}}$$

(vi) $4x - ky = 5$ $2x - 3y = 12$

$$\begin{array}{cc} a_1 = 4 & b_1 = -k \\ a_2 = 2 & b_2 = -3 \end{array} \quad \frac{a_1}{a_2} = \frac{4}{2} \quad \& \quad \frac{b_1}{b_2} = \frac{-k}{-3} = \frac{k}{3}$$

$$\frac{4}{2} \neq \frac{k}{3} \Rightarrow 2 \neq \frac{k}{3} \Rightarrow \boxed{k \neq 6}$$

୫. ନିମ୍ନରେ ଦତ୍ତ ସହସମୀକରଣ ଦ୍ଵୟର ଅସଂଖ୍ୟ ସମାଧାନ ରହିଲେ ପ୍ରତ୍ୟେକ କ୍ଷେତ୍ରରେ k ର ମାନ ସ୍ଥିର କର ।

(i) $7x - y - 5 = 0, 21x - 3y - k = 0,$

(ii) $8x + 5y - 9 = 0, kx + 10y - 18 = 0$

(iii) $kx - 2y + 6 = 0, 4x - 3y + 9 = 0,$

(iv) $2x + 3y = 5, 6x + ky = 15$

(v) $5x + 2y = k, 10x + 4y = 3,$

(vi) $kx - 2y - 6 = 0, 4x + 3y + 9 = 0$

ଅସଂଖ୍ୟ ସମାଧାନ : $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$

(i) $7x - y - 5 = 0 \quad 21x - 3y - k = 0$

$a_1 = 7 \quad b_1 = -1 \quad c_1 = -5 \quad \left| \quad \frac{7}{21} = \frac{-1}{-3} = \frac{-5}{-k} \right.$

$\Rightarrow \frac{1}{3} = \frac{1}{3} = \frac{5}{k} \Rightarrow \boxed{k = 15}$

(ii) $8x + 5y - 9 = 0 \quad kx + 10y - 18 = 0$

$a_1 = 8 \quad b_1 = 5 \quad c_1 = -9 \quad \left| \quad \frac{8}{k} = \frac{5}{10} = \frac{-9}{-18} \right.$

$\frac{8}{k} = \frac{5}{10} \Rightarrow \frac{8}{k} = \frac{1}{2} \Rightarrow \boxed{k = 16}$

(iii) $kx - 2y + 6 = 0 \quad 4x - 3y + 9 = 0$

$a_1 = k \quad b_1 = -2 \quad c_1 = 6 \quad \left| \quad \frac{k}{4} = \frac{-2}{-3} = \frac{6}{9} \right.$

$\frac{k}{4} = \frac{2}{3} \Rightarrow \boxed{k = \frac{8}{3}}$

୫. ନିମ୍ନରେ ଦତ୍ତ ସହସମୀକରଣ ଦ୍ଵୟର ଅସଂଖ୍ୟ ସମାଧାନ ରହିଲେ ପ୍ରତ୍ୟେକ କ୍ଷେତ୍ରରେ k ର ମାନ ସ୍ଥିର କର ।

(i) $7x - y - 5 = 0$, $21x - 3y - k = 0$,

(ii) $8x + 2y - 9 = 0$, $kx + 10y - 18 = 0$

(iii) $kx - 2y + 6 = 0$, $4x - 3y + 9 = 0$,

(iv) $2x + 3y = 5$, $6x + ky = 15$

(v) $5x + 2y = k$, $10x + 4y = 3$,

(vi) $kx - 2y - 6 = 0$, $4x + 3y + 9 = 0$

ଅସଂଖ୍ୟ ସମାଧାନ : $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$

(iv) $2x + 3y = 5$ $6x + ky = 15$

$$\begin{array}{ccc} a_1 = 2 & b_1 = 3 & c_1 = 5 \\ a_2 = 6 & b_2 = k & c_2 = 15 \end{array} \parallel \frac{a_1}{a_2} = \frac{2}{6} \quad \frac{b_1}{b_2} = \frac{3}{k} \quad \frac{c_1}{c_2} = \frac{5}{15}$$

$$\frac{2}{6} = \frac{3}{k} \Rightarrow \frac{3}{k} = \frac{1}{3} \Rightarrow \boxed{k = 9}$$

(v) $5x + 2y = k$ $10x + 4y = 3$

$$\begin{array}{ccc} a_1 = 5 & b_1 = 2 & c_1 = k \\ a_2 = 10 & b_2 = 4 & c_2 = 3 \end{array} \parallel \frac{a_1}{a_2} = \frac{5}{10} \parallel \frac{b_1}{b_2} = \frac{2}{4} \parallel \frac{c_1}{c_2} = \frac{k}{3}$$

$$\frac{2}{4} = \frac{k}{3} \Rightarrow \frac{1}{2} = \frac{k}{3} \Rightarrow \boxed{k = 3/2}$$

(vi) $kx - 2y - 6 = 0$ $4x + 3y + 9 = 0$

$$\begin{array}{ccc} a_1 = k & b_1 = -2 & c_1 = -6 \\ a_2 = 4 & b_2 = 3 & c_2 = 9 \end{array} \parallel \frac{a_1}{a_2} = \frac{k}{4} \parallel \frac{b_1}{b_2} = \frac{-2}{3} \parallel \frac{c_1}{c_2} = \frac{-6}{9}$$

$$\frac{k}{4} = \frac{-2}{3} \Rightarrow \boxed{k = -\frac{8}{3}}$$

9. k ର କେଉଁ ମୂଲ୍ୟ ପାଇଁ ନିମ୍ନରେ ଦତ୍ତ ସହସମୀକରଣଦ୍ୱୟ ଅସଙ୍ଗତ ହେବେ ?

(i) $8x + 5y - 9 = 0$, $kx + 10y - 15 = 0$,

(ii) $kx - 5y - 2 = 0$, $6x + 2y - 7 = 0$

(iii) $kx + 2y - 3 = 0$, $5x + 5y - 7 = 0$,

(iv) $kx - y - 2 = 0$, $6x - 2y - 3 = 0$

(v) $x + 2y - 5 = 0$, $8x + ky - 10 = 0$,

(vi) $3x - 4y + 7 = 0$, $kx + 3y - 5 = 0$

ଅନୁଷ୍ଠାନ no solution : $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$

(i) $8x + 5y - 9 = 0$

$kx + 10y - 15 = 0$

$$\begin{array}{ccc|c} a_1 = 8 & b_1 = 5 & c_1 = -9 & \\ a_2 = k & b_2 = 10 & c_2 = -15 & \end{array} \quad \left| \begin{array}{l} \frac{a_1}{a_2} = \frac{8}{k}, \frac{b_1}{b_2} = \frac{5}{10} = \frac{1}{2} \\ \frac{c_1}{c_2} = \frac{-9}{-15} = \frac{3}{5} \end{array} \right.$$

$$\frac{8}{k} = \frac{1}{2} \Rightarrow \boxed{k = 16}$$

(ii) $kx - 5y - 2 = 0$

$6x + 2y - 7 = 0$

$$\begin{array}{ccc|c} a_1 = k & b_1 = -5 & c_1 = -2 & \\ a_2 = 6 & b_2 = 2 & c_2 = -7 & \end{array} \quad \left| \begin{array}{l} \frac{a_1}{a_2} = \frac{k}{6}, \frac{b_1}{b_2} = \frac{-5}{2}, \frac{c_1}{c_2} = \frac{-2}{-7} = \frac{2}{7} \end{array} \right.$$

$$\frac{k}{6} = \frac{-5}{2} \Rightarrow \boxed{k = -15}$$

(iii) $kx + 2y - 3 = 0$

$5x + 5y - 7 = 0$

$$\begin{array}{ccc|c} a_1 = k & b_1 = 2 & c_1 = -3 & \\ a_2 = 5 & b_2 = 5 & c_2 = -7 & \end{array} \quad \left| \begin{array}{l} \frac{a_1}{a_2} = \frac{k}{5}, \frac{b_1}{b_2} = \frac{2}{5}, \frac{c_1}{c_2} = \frac{-3}{-7} = \frac{3}{7} \end{array} \right.$$

$$\frac{k}{5} = \frac{2}{5} \Rightarrow \boxed{k = 2}$$

9. k ର କେଉଁ ମୂଲ୍ୟ ପାଇଁ ନିମ୍ନରେ ଦିଆଯାଇଥିବା ସମୀକରଣଗୁଡ଼ିକର ସମାଧାନ ନାହିଁ ?

(i) $8x + 5y - 9 = 0$, $kx + 10y - 15 = 0$,

(ii) $kx - 5y - 2 = 0$, $6x + 2y - 7 = 0$

(iii) $kx + 2y - 3 = 0$, $5x + 5y - 7 = 0$,

(iv) $kx - y - 2 = 0$, $6x - 2y - 3 = 0$

(v) $x + 2y - 5 = 0$, $8x + ky - 10 = 0$,

(vi) $3x - 4y + 7 = 0$, $kx + 3y - 5 = 0$

ଅନୁଷ୍ଠାନ no solution : $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$

(iv) $kx - y - 2 = 0$ $a_1 = k$ $b_1 = -1$ $c_1 = -2$
 $6x - 2y - 3 = 0$ $a_2 = 6$ $b_2 = -2$ $c_2 = -3$

$$\frac{a_1}{a_2} = \frac{k}{6} \quad \frac{b_1}{b_2} = \frac{-1}{-2} = \frac{1}{2} \quad \frac{c_1}{c_2} = \frac{-2}{-3}$$

$$\frac{k}{6} = \frac{1}{2} \Rightarrow \boxed{k = 3}$$

(v) $x + 2y - 5 = 0$ $a_1 = 1$ $b_1 = 2$ $c_1 = -5$
 $8x + ky - 10 = 0$ $a_2 = 8$ $b_2 = k$ $c_2 = -10$

$$\frac{a_1}{a_2} = \frac{1}{8} \quad \frac{b_1}{b_2} = \frac{2}{k} \quad \frac{c_1}{c_2} = \frac{-5}{-10} = \frac{1}{2}$$

$$\frac{1}{8} = \frac{2}{k} \Rightarrow \boxed{k = 16}$$

(vi) $3x - 4y + 7 = 0$ $kx + 3y - 5 = 0$

$$a_1 = 3 \quad \frac{a_1}{a_2} = \frac{3}{k} \quad b_1 = -4 \quad \frac{b_1}{b_2} = \frac{-4}{3} \quad c_1 = 7 \quad \frac{c_1}{c_2} = \frac{7}{-5}$$

$$\frac{3}{k} = \frac{-4}{3} \Rightarrow \boxed{k = -\frac{9}{4}}$$