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PURE MATH

ALGEBRA AND FUNCTION

Level & Board	EDEXCEL (A-LEVEL)
TOPIC:	SIMULTANEOUS
PAPER TYPE:	SOLUTION 5
TOTAL QUESTIONS	8
TOTAL MARKS	38

Simultaneous 5

Q.1

As

$$3s + 4r = 9 \rightarrow (i)$$
$$-s + 5r = 1 \rightarrow (ii)$$

$(ii) \times 3$

$$-3s + 15r = 3 \rightarrow (iv)$$

Adding (i) and (iii), we get

$$\Longrightarrow \quad 19r = 12$$
$$\Longrightarrow \quad r = \frac{12}{19}$$

Put in (ii)

$$\Longrightarrow \quad -5 + 5\left(\frac{12}{19}\right) = 1$$
$$\Longrightarrow \quad \frac{60}{19} - 1 = s$$
$$\Longrightarrow \quad s = \frac{60-19}{19}$$
$$\Longrightarrow \quad s = \frac{41}{19}$$

Hence,

$$s.s = \left\{\frac{41}{19}, \frac{12}{19}\right\}$$

Q.2

Let $\quad 2s + p = 3 \rightarrow (i)$

$$-s + p = 1 \rightarrow (ii)$$

Using equation (ii. We get

$$\Longrightarrow \quad -s + p = 1$$
$$\Longrightarrow \quad p = 1 + s \rightarrow (iii)$$

Put in (i)

$$\Longrightarrow \quad 3s + 1 + s = 3$$
$$\Longrightarrow \quad 4s = 2$$
$$s = \frac{2}{4}$$
$$s = \frac{1}{2} \qquad \text{put in (iii)}$$
$$p = 1 + \frac{1}{2}$$
$$p = \frac{2+1}{2}$$
$$p = \frac{3}{2}$$
$$s.s = \left\{\frac{1}{2}, \frac{3}{2}\right\}$$

Q.3

As,

$$3x + y = 25 \rightarrow (i)$$

$$x - y = 20 \rightarrow (ii)$$

Adding (i) and (ii),

$$4x = 45$$

$$x = \frac{45}{4}$$

Pun in (ii)

$$\frac{45}{4} - y = 20$$

$$\Longrightarrow \quad y = -20 + \frac{45}{4}$$

$$y = \frac{-80+45}{4}$$

$$y = \frac{-45}{4}$$

Hence,

$$s.s = \left\{\frac{45}{4}, \frac{-45}{4}\right\}$$

Q.4

Let $3x + 17y = 3 \rightarrow (i)$

$x - y = 7 \rightarrow (ii)$

$Multiply\ (3) \times (ii)$

$3x - 3y = 21 \rightarrow (iii)$

Subtract (i) and (iii), we get

$$\Longrightarrow \quad 20y = 24$$

$$\Longrightarrow \quad y = \frac{24}{20} = \frac{6}{5}$$

$$\Longrightarrow \quad y = \frac{6}{5} \qquad \text{put in (ii)}$$

$$x - \frac{6}{5} = 7$$

$$x = 7 + \frac{6}{5}$$

$$x = \frac{35+6}{5}$$

$$c = \frac{41}{5}$$

Hence,

$$s.s = \left\{\frac{41}{5}, \frac{6}{5}\right\}$$

Q.5

As,

$$x + y = 3 \rightarrow (i)$$
$$2x - y = 1 \rightarrow (ii)$$

Adding (i) and (ii)

$$3x = 4$$
$$x = \frac{4}{3} \qquad \text{put in (ii)}$$
$$2\left(\frac{4}{3}\right) - y = 1$$
$$\Longrightarrow \quad y = 1 - \frac{8}{3}$$
$$\Longrightarrow \quad y = \frac{3-8}{3}$$
$$\Longrightarrow \quad y = \frac{-5}{3}$$

Hence,

$$s.s = \left\{\frac{4}{3}, \frac{-5}{3}\right\}$$

Q.6

Let $\quad m + 5p = 1 \rightarrow (i)$

$$-m + p = 9 \rightarrow (ii)$$

Adding (i) and (ii), we get

$$6p = 10$$
$$p = \frac{5}{3}$$

Put in (ii)

$$-m + p = 9$$
$$-m + \frac{5}{3} = 9$$
$$\Longrightarrow \quad m = \frac{5}{3} - 9$$
$$\Longrightarrow \quad m = \frac{5-27}{3}$$
$$\Longrightarrow \quad m = \frac{-23}{3}$$
$$s.s = \left\{\frac{-23}{3}, \frac{5}{3}\right\}$$

Q.7

As,

$$l + m = 3 \rightarrow (i)$$
$$3l - m = 4 \rightarrow (ii)$$

Adding (i) and (ii) , we get

$$-2l = 7$$
$$l = -\frac{7}{2}$$

Put in (i)

$$-\frac{7}{2} + m = 3$$
$$m = 3 + \frac{7}{3}$$
$$m = \frac{6+7}{2}$$
$$m = \frac{13}{2}$$

Hence,

$$s.s = \left\{-\frac{7}{2}, \frac{13}{2}\right\}$$

Q.8

As,

$$x + 5y = 3 \rightarrow (i)$$
$$x - y = 1 \rightarrow (ii)$$

Multiply 5(ii) we get

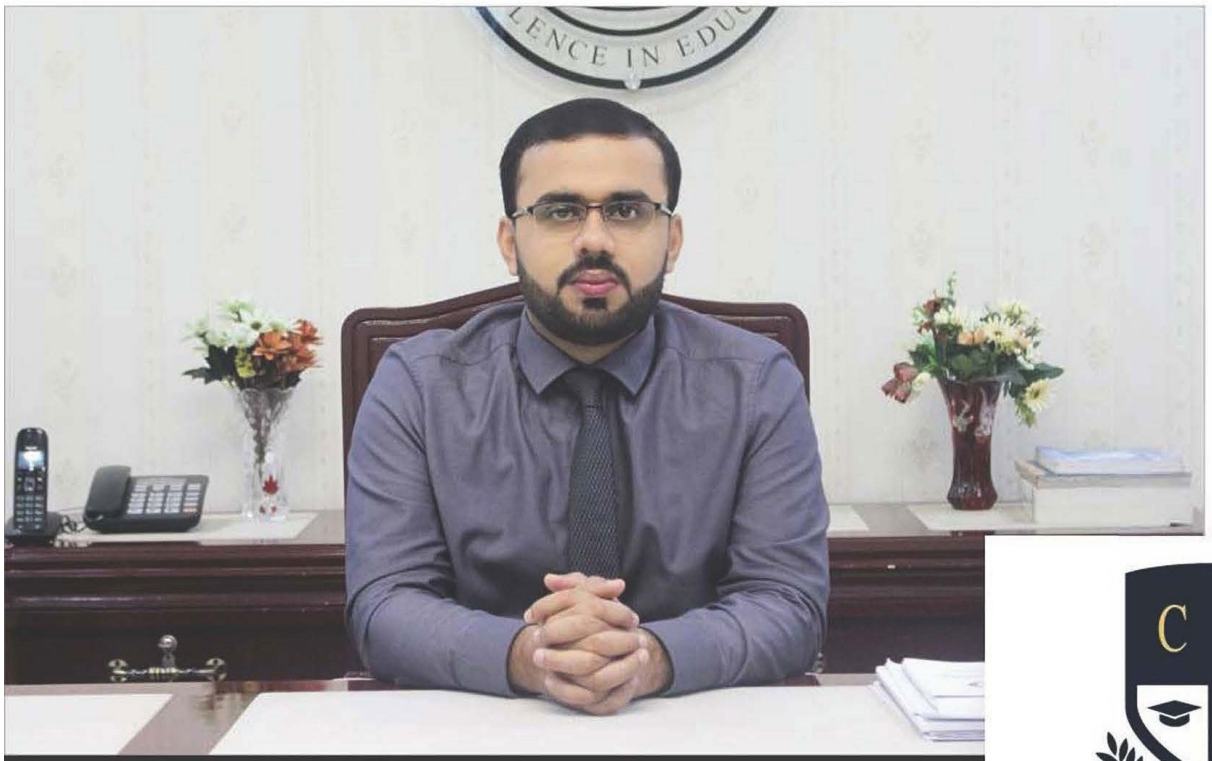
$$5x - 5y = 5 \rightarrow (iii)$$

Adding (i) and (iii), we get

$$6x = 8$$
$$x = \frac{4}{3} \qquad \text{put in (ii)}$$
$$\frac{4}{3} - y = 1$$
$$y = 1 - \frac{4}{3}$$
$$y = \frac{3-4}{3}$$
$$y = \frac{-1}{3}$$

Thus,

$$s.s \left\{\frac{4}{3}, -\frac{1}{3}\right\}$$



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