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PURE MATH

ALGEBRA AND FUNCTION

Level & Board	EDEXCEL (A-LEVEL)
TOPIC:	SIMULTANEOUS
PAPER TYPE:	SOLUTION 4
TOTAL QUESTIONS	8
TOTAL MARKS	38

Simultaneous 4

Q.1

As, $2x + y = 10 \rightarrow (i)$

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

Multiply 2(ii)

$-2x + 2y = 2 \rightarrow (iii)$

Adding (i) and (iii)

$\Longrightarrow \quad 3y = 12$

$y = 4$ put in (i)

$2x + 4 = 10$

$2x = 10 - 4$

$2x = 6$

$x = 3$

Hence,

$s.s = \{3,4\}$

Q.2

Let $x - y = 3 \rightarrow (i)$

$2x + 5y = 1 \rightarrow (ii)$

Using equation (i)

$x - y = 3$

$x = 3 + y \rightarrow (iii)$

Equation (iii) put in (ii)

$2(3 + y) + 5y = 1$

$6 + 2y + 5y = 1$

$7y = 1 - 6$

$7y = -5$

$y =$ - 5/7 put in (iii)

$x = 3 -$ 5/7

$x = \frac{21-5}{7}$

$x = \frac{16}{7}$

$s.s = \left\{\frac{16}{7}, \frac{-5}{7}\right\}$

Q.3

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

$3x + 5y = 2 \rightarrow (ii)$

Multiply $(i) \times 5$ and $(ii) \times 3$ we get

$25x + 15y = 5 \rightarrow (iii)$

$9x + 15y = 6 \rightarrow (iv)$

Subtract (iii) and (iv), we get

$\Longrightarrow \quad 16x = -1$

$x = \frac{-1}{16}$ put in (i)

$\Longrightarrow \quad 5\left(\frac{-1}{16}\right) + 3y = 1$

$\Longrightarrow \quad \frac{-5}{16} + 3y = 1$

$\Longrightarrow \quad 3y = 1\frac{+5}{16}$

$\Longrightarrow \quad 3y = \frac{16+5}{16}$

$\Longrightarrow \quad y = \frac{21}{16\times 3}$

$\Longrightarrow \quad y = \frac{7}{16}$

Hence,

$s.s = \left\{\frac{-1}{16}, \frac{7}{16}\right\}$

Q.4

$3m + 5p = 1 \rightarrow (i)$

Let $-m + p = 2 \rightarrow (ii)$

$(ii) \times 3$, we have

$-3m + 3p = 6 \rightarrow (iii)$

Adding (i) and (iii), we get

$8p = 7$

$p = \frac{7}{8}$ put in (ii)

$-m + \frac{7}{8} = 2$

$-m = 2 - \frac{7}{8} \quad = \frac{16-7}{8}$

$-m = \frac{9}{8}$

$\Longrightarrow \quad m = \frac{-9}{8}$

$s.s = \left\{\frac{-9}{8}, \frac{7}{8}\right\}$

Q.5

Let $3x + y = 50 \rightarrow (i)$

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

Adding equation (i) and (ii), we get

$4x = 70$

$x = \frac{70}{4}$

$x = \frac{35}{2}$ put in (ii)

$x - y = 20$

$x - 20 = y$

$\Longrightarrow \quad y = \frac{35}{2} - 20$

$y = \frac{35-40}{2}$

$y = \frac{-5}{2}$

Hence,

$s.s = \left\{\frac{35}{2}, \frac{-5}{2}\right\}$

Q.6

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

$x - y = 1 \rightarrow (ii)$

Adding (i) and (ii)

$2x = 4$

$x = 2$ put in (i)

$x + y = 3$

$2 + y = 3$

$y = 1$

$s.s = \{2,1\}$

Q.7

Let $3x + y = 5 \rightarrow (i)$

$x - y = 2 \rightarrow (ii)$

Adding (i) and (ii)

$4x = 7$

$x = \frac{7}{4}$ put in (i)

$3\left(\frac{7}{4}\right) + y = 5$

$\frac{21}{4} + y = 5$

$y = 5\frac{-21}{5}$

$y = \frac{20-21}{4}$

$y = \frac{-1}{4}$

So,

$\left\{\frac{7}{4}, \frac{-1}{4}\right\}$

Q.8

Let $m + p = 20 \rightarrow (i)$

$2p - m = 10 \rightarrow (ii)$

Adding (i) and (ii)

$3p = 30$

$p = 10$

Put in (i)

$m + 10 = 20$

$m = 20 - 10$

$m = 10$

Hence,

$s.s = \{10,10\}$

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