Simultaneous Linear Equations (Edexcel GCSE Exam Questions)

Q1.

Solve the simultaneous equations

$$4x + 2y = 7 \quad (1)$$
$$3x - 5y = -24 \quad (2)$$

(1) × 5 $\quad 20x + 10y = 35 \quad (3)$

(2) × 2 $\quad 6x - 10y = -48 \quad (4)$

(3) + (4) $\quad 26x = -13$

$x = \frac{-13}{26}$

$x = -\frac{1}{2}$

Sub for x in (1)

$4(-\frac{1}{2}) + 2y = 7$

$-2 + 2y = 7$

$2y = 7 + 2$

$2y = 9$

$y = \frac{9}{2}$

$x =$ $-\frac{1}{2}$

$y =$ $\frac{9}{2}$

(Total for question = 4 marks)

Q2.

Solve the simultaneous equations

$$5x + 2y = -2 \quad (1)$$
$$3x - 5y = 11.2 \quad (2)$$

(1) × 5 $\quad 25x + 10y = -10 \quad (3)$

(2) × 2 $\quad 6x - 10y = 22.4 \quad (4)$

(3) + (4) $\quad 31x = 12.4$

$x = \frac{12.4}{31}$

$x = 0.4$

Sub for x in (1)

$5(0.4) + 2y = -2$

$2 + 2y = -2$

$2y = -2 - 2$

$2y = -4$

$y = \frac{-4}{2}$

$y = -2$

$x =$ 0.4

$y =$ −2

(Total for question = 4 marks)

Q3.

Solve the simultaneous equations

$3x + 4y = 5$ ①

$2x - 3y = 9$ ②

① × 3 $9x + 12y = 15$ ③

② × 4 $8x - 12y = 36$ ④

③ + ④ $17x = 51$

$x = \frac{51}{17}$

$x = 3$

Sub for x in ①

$3(3) + 4y = 5$

$9 + 4y = 5$

$4y = 5 - 9$

$4y = -4$

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

$y = -1$

$x =$ 3

$y =$ −1

(Total for Question is 4 marks)

Q4.

Solve the simultaneous equations

$4x + 7y = 1$ ①

$3x + 10y = 15$ ②

① × 10 $40x + 70y = 10$ ③

② × 7 $21x + 70y = 105$ ④

③ − ④ $19x = -95$

$x = \frac{-95}{19}$

$x = -5$

Sub for x in ①

$4(-5) + 7y = 1$

$-20 + 7y = 1$

$7y = 1 + 20$

$7y = 21$

$y = \frac{21}{7}$

$y = 3$

$x =$ −5

$y =$ 3

(Total for Question is 4 marks)

Q5.

Solve

$2x + 3y = \frac{2}{3}$ ①

$3x - 4y = 18$ ②

① × 4 $8x + 12y = \frac{8}{3}$ ③

② × 3 $9x - 12y = 54$ ④

③ + ④ $17x = 54 + \frac{8}{3}$

$17x = \frac{162}{3} + \frac{8}{3}$

$17x = \frac{170}{3}$

$x = \frac{170}{3 \times 17}$

$x = \frac{10}{3}$

Sub for x in ①

$8\left(\frac{10}{3}\right) + 12y = \frac{8}{3}$

$\frac{80}{3} + 12y = \frac{8}{3}$

$12y = \frac{8}{3} - \frac{80}{3}$

$12y = -\frac{72}{3}$

$12y = -24$

$y = \frac{-24}{12}$

$y = -2$

$x =$ $\frac{10}{3}$

$y =$ -2

(Total for question = 4 marks)

Q6.

Solve the simultaneous equations

$3x + 2y = 4$ ①

$4x + 5y = 17$ ②

① × 5 $15x + 10y = 20$ ③

② × 2 $8x + 10y = 34$ ④

③ − ④ $7x = -14$

$x = \frac{-14}{7}$

$x = -2$

Sub for x in ②

$8(-2) + 10y = 34$

$-16 + 10y = 34$

$10y = 34 + 16$

$10y = 50$

$y = \frac{50}{10}$

$y = 5$

x = -2

y = 5

(Total for Question is 4 marks)

Q7.

Solve the simultaneous equations

$$4x + y = 25 \quad (1)$$
$$x - 3y = 16 \quad (2)$$

(1) × 3 $\quad 12x + 3y = 75 \quad (3)$

(2) + (3) $\quad 13x = 91$

$x = \frac{91}{13}$

$x = 7$

Sub for x in (1)

$4(7) + y = 25$

$28 + y = 25$

$y = 25 - 28$

$y = -3$

$x =$ 7

$y =$ −3

(Total for Question is 3 marks)

Q8.

Solve the simultaneous equations

$$3x - 2y = 7 \quad (1)$$
$$7x + 2y = 13 \quad (2)$$

(1) + (2) $\quad 10x = 20$

$x = \frac{20}{10}$

$x = 2$

Sub for x in (2)

$7(2) + 2y = 13$

$14 + 2y = 13$

$2y = 13 - 14$

$2y = -1$

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

$x = 2$ $\quad y = -\frac{1}{2}$

(Total for Question is 3 marks)

Q9.

Solve the simultaneous equations

$3x + 10y = 7$ ①
$x - 4y = 6$ ②

① × 2 $\quad 6x + 20y = 14$ ③
② × 5 $\quad 5x - 20y = 30$ ④

③ + ④ $\quad 11x = 44$

$x = \frac{44}{11}$

$x = 4$

Sub for x in ①

$6(4) + 20y = 14$

$24 + 20y = 14$

$20y = 14 - 24$

$20y = -10$

$y = \frac{-10}{20}$

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

$x =$ 4
$y =$ $-\frac{1}{2}$

(Total for Question is 3 marks)

Q10.

Solve the simultaneous equations

$4x - 5y = 33$ ①

$3x + y = 1$ ②

② × 5 $\quad 15x + 5y = 5$ ③

① + ③ $\quad 19x = 38$

$x = \frac{38}{19}$

$x = 2$

Sub for x in ②

$3(2) + y = 1$

$6 + y = 1$

$y = 1 - 6$

$y = -5$

$x =$ 2

$y =$ -5

(Total for Question is 3 marks)