

1 (c) Solve the simultaneous equations

$$4x + 3y = 17 \quad \text{--- ①}$$

$$x + 2y = 5$$

Show clear algebraic working.

$$x = 5 - 2y \quad \text{--- ②}$$

substitute ② into ① :

$$4(5 - 2y) + 3y = 17 \quad \text{①}$$

$$20 - 8y + 3y = 17 \quad \text{--- } -20$$

$$-5y = 17 - 20$$

$$\div (-5) \quad \begin{aligned} -5y &= -3 \\ y &= \frac{3}{5} = 0.6 \end{aligned}$$

$$x = 5 - 2(0.6) \quad \text{①}$$

$$= 5 - 1.2$$

$$= 3.8$$

$$x = \underline{\underline{3.8}} \quad \text{①}$$

$$y = \underline{\underline{0.6}}$$

(3)

(Total for Question 1 is 3 marks)

2 Solve the simultaneous equations

$$3x + 5y = 6$$

$$7x - 5y = -11 \quad \text{--- ①}$$

$$x = \frac{6-5y}{3} \quad \text{--- ②}$$

Show clear algebraic working.

Substitute ② into ① :

$$7\left(\frac{6-5y}{3}\right) - 5y = -11$$

$$7(6-5y) - 15y = -33$$

$$42 - 35y - 15y = -33$$

$$-50y = -33 - 42 \quad \text{--- 42}$$

$$\div 50 \quad \begin{aligned} -50y &= -75 \quad \text{①} \\ y &= \frac{-75}{-50} = 1.5 \quad \text{①} \end{aligned}$$

$$x = \frac{6-5(1.5)}{3}$$

$$= -0.5 \quad \text{①}$$

$$x = \frac{-0.5}{1}$$

$$y = \frac{1.5}{1}$$

(Total for Question 2 is 3 marks)

5a + 2c = 10 — ①

2a - 4c = 7

÷ 2 ↪ a - 2c = 7/2 — ②

Show clear algebraic working.

$$c = -0.625$$

(Total for Question 3 is 3 marks)

4 Solve the simultaneous equations

$$\begin{array}{rcl}
 7x + 3y = 3 & \xrightarrow{\times 3} & 21x + 9y = 9 \\
 3x - y = 7 & \xrightarrow{\times 7} & 21x - 7y = 49
 \end{array}$$

Show clear algebraic working.

$$9y - (-7y) = 9 - 49$$

(1)

$$16y = -40$$

$$y = \frac{-40}{16}$$

$$= -2.5$$

$$3x + 2.5 = 7 \quad (1)$$

$$3x = 4.5$$

$$x = \frac{4.5}{3} = 1.5$$

$$x = 1.5 \quad (1)$$

$$y = -2.5$$

(Total for Question 4 is 3 marks)

5 Solve the simultaneous equations

$$\begin{array}{rcl} 3x + 5y = 3.1 & \xrightarrow{\times 2} & 6x + 10y = 6.2 \quad - \textcircled{1} \\ 6x + 3y = 3.75 & & - \textcircled{2} \end{array}$$

Show clear algebraic working.

By elimination:

$$\textcircled{1} - \textcircled{2} :$$

$$10y - 3y = 6.2 - 3.75$$

$$7y = 2.45 \quad \textcircled{1}$$

$$y = 0.35$$

$$3x + 5(0.35) = 3.1 \quad \textcircled{1}$$

$$3x + 1.75 = 3.1$$

$$3x = 1.35$$

$$x = 0.45$$

$$x = 0.45 \quad \textcircled{1}$$

$$y = 0.35$$

(Total for Question 5 is 3 marks)

6 Solve the simultaneous equations

$$\begin{aligned}x + 2y &= 15 & x &= 15 - 2y \quad \text{--- ①} \\4x - 6y &= 4 & \text{--- ②}\end{aligned}$$

Show clear algebraic working.

subs ① into ② :

$$4(15 - 2y) - 6y = 4$$

$$60 - 8y - 6y = 4 \quad \text{①}$$

$$56 = 14y$$

$$y = 4$$

$$\begin{aligned}x &= 15 - 2(4) \quad \text{①} \\&= 7\end{aligned}$$

$$x = \underline{\quad 7 \quad} \quad \text{①}$$

$$y = \underline{\quad 4 \quad}$$

(Total for Question 6 is 3 marks)

7 Solve the simultaneous equations

$$5x + 4y = -2 \quad \text{--- ①}$$

$$2x - y = 4.4$$

Show clear algebraic working.

$$y = 2x - 4.4 \quad \text{--- ②}$$

$$5x + 4(2x - 4.4) = -2 \quad \text{①}$$

$$5x + 8x - 17.6 = -2$$

$$13x = 15.6 \quad \text{①}$$

$$x = \frac{15.6}{13}$$

$$= 1.2$$

$$y = 2(1.2) - 4.4$$

$$= 2.4 - 4.4 \quad \text{①}$$

$$= -2$$

$$x = \overset{1.2}{\dots\dots\dots}$$

$$y = \overset{-2}{\dots\dots\dots}$$

(Total for Question 7 is 3 marks)

8 Solve the simultaneous equations

$$2x + 9y = 14.5 \quad \text{--- (1)}$$

$$7x + 3y = 8$$

Show clear algebraic working.

$$\begin{array}{r} \times 3 \downarrow \\ 21x + 9y = 24 \end{array} \quad \text{--- (2)}$$

$$\textcircled{2} - \textcircled{1} :$$

$$21x - 2x + 9y - 9y = 24 - 14.5$$

$$19x = 9.5 \quad \textcircled{1}$$

$$x = \frac{9.5}{19} = \frac{1}{2}$$

$$2\left(\frac{1}{2}\right) + 9y = 14.5 \quad \textcircled{1}$$

$$1 + 9y = 14.5$$

$$9y = 13.5$$

$$y = \frac{13.5}{9} = 1.5$$

$$x = 0.5 \quad \textcircled{1}$$

$$y = 1.5$$

(Total for Question 8 is 3 marks)