Solutions by
Kenneth Stafford
MATHS TUTOR
ken@kennethstafford.co.uk

GCSE (9-1) Grade 5 Simultaneous Equations

Instructions

Use **black** ink or ball-point pen.
Fill in the boxes at the top of this page with your name.
Answer **all** questions.
Answer the questions in the spaces provided
– there may be more space than you need.
Show all your working out

Information

The marks for **each** question are shown in brackets.
use this as a guide as to how much time to spend on each question.
Questions labelled with an **asterisk** (*) are ones where the quality of your written communication will be assessed

Advice

Read each question carefully before you start to answer it
Attempt every question
Check your answers if you have time at the end

1. Solve the simultaneous equations

$4 \times \quad 3x + 2y = 4$

$3 \times \quad 4x + 5y = 17$

$12x + 8y = 16$

$12x + 15y = 51$

$-7y = -35$

$y = 5$

$3x + 2(5) = 4$

$3x + 10 = 4$

$3x = -6$

$x = -2$

$x =$ ..... -2 .....

$y =$ ..... 5 .....

(4 marks)

2. Solve the equations

$2 \times \quad 3x + 5y = 19$

$5 \times \quad 4x - 2y = -18$

$6x + 10y = 38$

$20x - 10y = -90$

$26x = -52$

$x = -2$

$3(-2) + 5y = 19$

$-6 + 5y = 19$

$5y = 25$

$y = 5$

$x =$ -2

$y =$ 5

(4 marks)

3. Solve the simultaneous equations

$2 \times \quad 3x + 4y = 200$

$3 \times \quad 2x + 3y = 144$

$6x + 8y = 400$

$6x + 9y = 432$

$y = 32$

$3x + 4(32) = 200$

$3x + 128 = 200$

$3x = 72$

$x = 24$

$x =$ 24

$y =$ 32

(4 marks)

4. Solve the simultaneous equations

$3 \times \quad 5x + 2y = 11$

$2 \times \quad 4x - 3y = 18$

$15x + 6y = 33$

$8x - 6y = 36$

$23x = 69$

$x = 3$

$5(3) + 2y = 11$

$15 + 2y = 11$

$2y = -4$

$y = -2$

$x =$ 3

$y =$ -2

(4 marks)

5. Solve the simultaneous equations

$$4x - 3y = 11$$
$$10x + 2y = -1$$

$2\times$: $8x - 6y = 22$

$3\times$: $30x + 6y = -3$

$38x = 19$

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

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

$10\left(\frac{1}{2}\right) + 2y = -1$

$5 + 2y = -1$

$2y = -6$

$y = -3$

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

$y =$ -3

(4 marks)

6. Solve the simultaneous equations

$3x + 7y = 26$

$4x + 5y = 13$

$4 \times 3x + 7y = 26$ → $12x + 28y = 104$

$3 \times 4x + 5y = 13$ → $12x + 15y = 39$

$13y = 65$

$y = 5$

$3x + 7(5) = 26$

$3x + 35 = 26$

$3x = -9$

$x = -3$

$x =$ -3

$y =$ 5

(4 marks)

7. Solve the simultaneous equations

$3 \times \quad 6x - 2y = 33$

$2 \times \quad 4x + 3y = 9$

$18x - 6y = 99$

$8x + 6y = 18$

$26x = 117$

$x = \frac{117}{26}$

$x = 4.5$

$4(4.5) + 3y = 9$

$18 + 3y = 9$

$3y = -9$

$y = -3$

$x =$ 4.5

$y =$ -3

(4 marks)

8. Solve the simultaneous equations

$3 \times \quad 2x - 5y = 13$

$5 \times \quad 6x + 3y = 3$

$6x - 15y = 39$

$30x + 15y = 15$

$36x = 54$

$x = \frac{54}{36}$

$x = 1.5$

$6(1.5) + 3y = 3$

$9 + 3y = 3$

$3y = -6$

$y = -2$

$x = 1.5$

$y = -2$

9. Solve the simultaneous equations

$2 \times \quad 6x + 5y = 5$

$3x - 10y = 15$

$12x + 10y = 10$

$3x - 10y = 15$

$15x = 25$

$x = \frac{25}{15}$

$x = \frac{5}{3}$

$6\left(\frac{5}{3}\right) + 5y = 5$

$10 + 5y = 5$

$5y = -5$

$y = -1$

$x = \frac{5}{3}$

$y = -1$

10. Solve the simultaneous equations

$-2 \times \quad 8x - 4y = 7$

$12x - 8y = 6$

$-16x + 8y = -14$

$12x - 8y = 6$

$-4x = -8$

$x = -8/-4$

$x = 2$

$8(2) - 4y = 7$

$16 - 4y = 7$

$-4y = -9$

$y = -9/4$

$x = 2$

$y = -9/4$

11. Solve the simultaneous equations

$3 \times \quad 3x + 4y = 6$

$2 \times \quad 5x + 6y = 11$

$9x + 12y = 18$

$10x + 12y = 22$

$x = 4$

$3(4) + 4y = 6$

$12 + 4y = 6$

$4y = -6$

$y = -6/4$

$y = -3/2$

$y = -1.5$

$x = 4$

$y = -1.5$

12. Q is the point of intersection of the lines with equations $5x + 3y = 9$ and $7x - 2y = 25$.

Write down the coordinates of Q

$2 \times \quad 5x + 3y = 9$

$3 \times \quad 7x - 2y = 25$

$10x + 6y = 18$

$21x - 6y = 75$

$31x \qquad = 93$

$x = 3$

$5(3) + 3y = 9$

$15 + 3y = 9$

$3y = -6$

$y = -2$

(3 , −2)

(5 marks)

13. Q is the point of intersection of the lines with equations $4x + 5y = 13$ and $3x - 2y = 27$.

Write down the coordinates of Q

$2 \times \quad 4x + 5y = 13$

$5 \times \quad 3x - 2y = 27$

$8x + 10y = 26$

$15x - 10y = 135$

$23x \qquad = 161$

$x = 161/23$

$x = 7$

$4(7) + 5y = 13$

$28 + 5y = 13$

$5y = -15$

$y = -3$

(7 , −3)

(5 marks)