

GCSE MATHS • GRADE 5

MATHS



MODEL ANSWERS

SIMULTANEOUS EQUATIONS

SCORE

/92

PERCENTAGE

%

STEMUP

1 Solve the simultaneous equations

$$5x - 4y = 15$$

$$3x + 4y = -23$$

add: $8x = -8$

sub $x = -1$ into (1): $5 \times (-1) - 4y = 15$

$$x = -1, y = -5$$

1

 / 1

2 Solve the simultaneous equations

$$x + 2y = 2$$

$$x - 2y = -10$$

add: $2x = -8$

sub $x = -4$ into (1): $(-4) + 2y = 2$

$$x = -4, y = 3$$

1

 / 1

3 Solve the simultaneous equations

$$4x - 6y = -28$$

$$4x + 6y = -4$$

subtract: $-12y = -24$

sub $y = 2$ into (1): $4x - 6 \times 2 = -28$

$$x = -4, y = 2$$

1

 / 1

4 Solve the simultaneous equations

$$7x - 4y = -56$$

$$6x + 4y = 4$$

add: $13x = -52$

sub $x = -4$ into (1): $7 \times (-4) - 4y = -56$

$$x = -4, y = 7$$

/ 1

5 Solve the simultaneous equations

$$3x - y = 0$$

$$2x - y = -1$$

subtract: $x = 1$

sub $x = 1$ into (1): $3 \times 1 - y = 0$

$$x = 1, y = 3$$

/ 1

6 Solve the simultaneous equations

$$2x - 3y = -26$$

$$2x + 3y = 22$$

subtract: $-6y = -48$

sub $y = 8$ into (1): $2x - 3 \times 8 = -26$

$$x = -1, y = 8$$

/ 1

7 Solve the simultaneous equations

$$2x + 2y = 0$$

$$6x + 2y = -24$$

subtract: $-4x = 24$

sub $x = -6$ into (1): $2 \times (-6) + 2y = 0$

$$x = -6, y = 6$$

/ 1

8 Solve the simultaneous equations

$$7x - y = 41$$

$$x + y = 15$$

add: $8x = 56$

sub $x = 7$ into (1): $7 \times 7 - y = 41$

$$x = 7, y = 8$$

/ 1

9 Solve the simultaneous equations

$$4x - 3y = -11$$

$$x - y = -3$$

(2) $\times 3$: $3x - 3y = -9$

subtract: $x = -2$

sub $x = -2$ into (1): $4 \times (-2) - 3y = -11$

$$x = -2, y = 1$$

/ 1

10 Solve the simultaneous equations

$$4x + 3y = 16$$

$$7x - 3y = -38$$

add: $11x = -22$

sub $x = -2$ into (1): $4 \times (-2) + 3y = 16$

$$x = -2, y = 8$$

1

 / 1

11 Solve the simultaneous equations

$$5x + 6y = 49$$

$$5x - 6y = 1$$

add: $10x = 50$

sub $x = 5$ into (1): $5 \times 5 + 6y = 49$

$$x = 5, y = 4$$

1

 / 1

12 Solve the simultaneous equations

$$7x - 2y = -20$$

$$7x + 6y = 4$$

(1) $\times 3$: $21x - 6y = -60$

add: $28x = -56$

sub $x = -2$ into (1): $7 \times (-2) - 2y = -20$

$$x = -2, y = 3$$

1

 / 1

- 13 Solve the simultaneous equations

$$4x - 4y = 0$$

$$x - 4y = -21$$

$$\text{subtract: } 3x = 21$$

$$\text{sub } x = 7 \text{ into (1): } 4 \times 7 - 4y = 0$$

$$x = 7, y = 7$$

1

 / 1

- 14 Solve the simultaneous equations

$$2x - y = 2$$

$$7x + y = -11$$

$$\text{add: } 9x = -9$$

$$\text{sub } x = -1 \text{ into (1): } 2 \times (-1) - y = 2$$

$$x = -1, y = -4$$

1

 / 1

- 15 Solve the simultaneous equations

$$7x + 3y = 29$$

$$5x - 9y = -35$$

$$(1) \times 3: 21x + 9y = 87$$

$$\text{add: } 26x = 52$$

$$\text{sub } x = 2 \text{ into (1): } 7 \times 2 + 3y = 29$$

$$x = 2, y = 5$$

1

 / 1

- 16 Solve the simultaneous equations

$$x - y = -3$$

$$6x - y = 22$$

$$\text{subtract: } -5x = -25$$

$$\text{sub } x = 5 \text{ into (1): } 5 - y = -3$$

$$x = 5, y = 8$$

1 / 1

- 17 The sum of two numbers is 43.
The difference between the two numbers is 33.
Work out the two numbers.

$$x + y = 43$$

$$x - y = 33$$

$$\text{add: } 2x = 76$$

$$x = 38$$

$$y = 5$$

$$38 \text{ and } 5$$

1 / 1

- 18 Solve the simultaneous equations

$$2x - 4y = -32$$

$$x + y = -1$$

$$(2) \times 4: 4x + 4y = -4$$

$$\text{add: } 6x = -36$$

$$\text{sub } x = -6 \text{ into (1): } 2 \times (-6) - 4y = -32$$

$$x = -6, y = 5$$

1 / 1

19 Solve the simultaneous equations

$$3x + 3y = -3$$

$$6x - 5y = 27$$

$$(1) \times 5: 15x + 15y = -15$$

$$(2) \times 3: 18x - 15y = 81$$

$$\text{add: } 33x = 66$$

$$\text{sub } x = 2 \text{ into (1): } 3 \times 2 + 3y = -3$$

$$x = 2, y = -3$$

1 / 1

20 The sum of two numbers is 32.

The difference between the two numbers is 6.

Work out the two numbers.

$$x + y = 32$$

$$x - y = 6$$

$$\text{add: } 2x = 38$$

$$x = 19$$

$$y = 13$$

$$19 \text{ and } 13$$

1 / 1

21 Solve the simultaneous equations

$$5x - 4y = -5$$

$$4x + y = 17$$

$$(2) \times 4: 16x + 4y = 68$$

$$\text{add: } 21x = 63$$

$$\text{sub } x = 3 \text{ into (1): } 5 \times 3 - 4y = -5$$

$$x = 3, y = 5$$

2 / 2

- 22 Solve the simultaneous equations

$$6x - 3y = 3$$

$$3x - 5y = -2$$

$$(2) \times 2: 6x - 10y = -4$$

$$\text{subtract: } 7y = 7$$

$$\text{sub } y = 1 \text{ into (1): } 6x - 3 \times 1 = 3$$

$$x = 1, y = 1$$

2 / 2

- 23 The sum of two numbers is 64.

Four times the larger number minus the smaller number is 121.

Work out the two numbers.

$$x + y = 64$$

$$4x - y = 121$$

$$\text{add: } 5x = 185$$

$$x = 37$$

$$y = 27$$

$$37 \text{ and } 27$$

2 / 2

- 24 Pencils are sold in single packs and in multi packs.

There is a total of 154 pencils in 5 single packs and 4 multi packs.

There is a total of 84 pencils in 2 single packs and 3 multi packs.

Work out the number of pencils in each single pack and in each multi pack.

$$\text{let single pack} = s, \text{ multi pack} = b$$

$$5s + 4b = 154$$

$$2s + 3b = 84$$

$$(1) \times 2: 10s + 8b = 308$$

$$(2) \times 5: 10s + 15b = 420$$

$$\text{subtract: } -7b = -112$$

$$b = 16$$

$$s = 18$$

$$\text{Single } 18, \text{ Multi } 16$$

2 / 2

- 25 Solve the simultaneous equations

$$5x - 2y = 34$$

$$3x - 5y = 9$$

$$(1) \times 3: 15x - 6y = 102$$

$$(2) \times 5: 15x - 25y = 45$$

$$\text{subtract: } 19y = 57$$

$$\text{sub } y = 3 \text{ into (1): } 5x - 2 \times 3 = 34$$

$$x = 8, y = 3$$

2 / 2

- 26 Tickets for a cinema cost one price for an adult and one price for a child.

1 adult ticket and 5 child tickets cost £48 in total.

2 adult tickets and 4 child tickets cost £60 in total.

Work out the cost of one adult ticket and the cost of one child ticket.

$$\text{let adult} = a, \text{ child} = c$$

$$a + 5c = 48$$

$$2a + 4c = 60$$

$$(1) \times 2: 2a + 10c = 96$$

$$\text{subtract: } 6c = 36$$

$$c = 6$$

$$a = 18$$

$$\text{Adult } £18, \text{ Child } £6$$

2 / 2

- 27 Pencils are sold in single packs and in multi packs.

There is a total of 52 pencils in 4 single packs and 2 multi packs.

There is a total of 86 pencils in 5 single packs and 6 multi packs.

Work out the number of pencils in each single pack and in each multi pack.

$$\text{let single pack} = s, \text{ multi pack} = b$$

$$4s + 2b = 52$$

$$5s + 6b = 86$$

$$(1) \times 5: 20s + 10b = 260$$

$$(2) \times 4: 20s + 24b = 344$$

$$\text{subtract: } -14b = -84$$

$$b = 6$$

$$s = 10$$

$$\text{Single } 10, \text{ Multi } 6$$

2 / 2

- 28 Solve the simultaneous equations

$$4x + 5y = 1$$

$$2x + 3y = -1$$

$$(1) \times 3: 12x + 15y = 3$$

$$(2) \times 5: 10x + 15y = -5$$

$$\text{subtract: } 2x = 8$$

$$\text{sub } x = 4 \text{ into (1): } 4 \times 4 + 5y = 1$$

$$x = 4, y = -3$$

2 / 2

- 29 Tickets for a museum cost one price for an adult and one price for a child.

4 adult tickets and 5 child tickets cost £119 in total.

1 adult ticket and 1 child ticket cost £27 in total.

Work out the cost of one adult ticket and the cost of one child ticket.

$$\text{let adult} = a, \text{ child} = c$$

$$4a + 5c = 119$$

$$a + c = 27$$

$$(2) \times 4: 4a + 4c = 108$$

$$\text{subtract: } c = 11$$

$$c = 11$$

$$a = 16$$

$$\text{Adult } £16, \text{ Child } £11$$

2 / 2

- 30 Sweets are sold in small packs and in big packs.

There is a total of 124 sweets in 4 small packs and 2 big packs.

There is a total of 218 sweets in 6 small packs and 5 big packs.

Work out the number of sweets in each small pack and in each big pack.

$$\text{let small pack} = s, \text{ big pack} = b$$

$$4s + 2b = 124$$

$$6s + 5b = 218$$

$$(1) \times 3: 12s + 6b = 372$$

$$(2) \times 2: 12s + 10b = 436$$

$$\text{subtract: } -4b = -64$$

$$b = 16$$

$$s = 23$$

$$\text{Small } 23, \text{ Big } 16$$

2 / 2

31 Solve the simultaneous equations

$$5x + 4y = -1$$

$$2x + 2y = 0$$

$$(1) \times 2: 10x + 8y = -2$$

$$(2) \times 5: 10x + 10y = 0$$

$$\text{subtract: } -2y = -2$$

$$\text{sub } y = 1 \text{ into (1): } 5x + 4 \times 1 = -1$$

$$x = -1, y = 1$$

2 / 2

32 Solve the simultaneous equations

$$2x - 3y = -13$$

$$x + 6y - 16 = 0$$

$$\text{rearrange: } x + 6y = 16$$

$$(2) \times 2: 4x - 6y = -26$$

$$\text{add: } 5x = -10$$

$$\text{sub } x = -2 \text{ into (1): } (-2) + 6y = 16$$

$$x = -2, y = 3$$

2 / 2

33 Biscuits are sold in standard packs and in family packs.

There is a total of 174 biscuits in 6 standard packs and 5 family packs.

There is a total of 132 biscuits in 4 standard packs and 6 family packs.

Work out the number of biscuits in each standard pack and in each family pack.

let standard pack = s , family pack = b

$$6s + 5b = 174$$

$$4s + 6b = 132$$

$$(1) \times 2: 12s + 10b = 348$$

$$(2) \times 3: 12s + 18b = 396$$

$$\text{subtract: } -8b = -48$$

$$b = 6$$

$$s = 24$$

Standard 24, Family 6

2 / 2

34 Solve the simultaneous equations

$$3x + 5y = -24$$

$$4x + 4y = -16$$

$$(1) \times 4: 12x + 20y = -96$$

$$(2) \times 3: 12x + 12y = -48$$

$$\text{subtract: } 8y = -48$$

$$\text{sub } y = -6 \text{ into (1): } 3x + 5 \times (-6) = -24$$

$$x = 2, y = -6$$

2 / 2

35 Solve the simultaneous equations

$$x = -5 + y$$

$$7x - y = -11$$

$$\text{rearrange: } x - y = -5$$

$$\text{subtract: } -6x = 6$$

$$\text{sub } x = -1 \text{ into (1): } (-1) - y = -5$$

$$x = -1, y = 4$$

2 / 2

36 Biscuits are sold in standard packs and in family packs.

There is a total of 62 biscuits in 5 standard packs and 4 family packs.

There is a total of 56 biscuits in 4 standard packs and 4 family packs.

Work out the number of biscuits in each standard pack and in each family pack.

let standard pack = s , family pack = b

$$5s + 4b = 62$$

$$4s + 4b = 56$$

$$(1) \times 4: 20s + 16b = 248$$

$$(2) \times 5: 20s + 20b = 280$$

$$\text{subtract: } -4b = -32$$

$$b = 8$$

$$s = 6$$

Standard 6, Family 8

2 / 2

37 Solve the simultaneous equations

$$4x - 4y = 0$$

$$5x + 2y = 42$$

$$(1) \times 5: 20x - 20y = 0$$

$$(2) \times 4: 20x + 8y = 168$$

$$\text{subtract: } -28y = -168$$

$$\text{sub } y = 6 \text{ into (1): } 4x - 4 \times 6 = 0$$

$$x = 6, y = 6$$

2 / 2

38 Solve the simultaneous equations

$$5x + 6y = 19$$

$$2x - 6y - 16 = 0$$

$$\text{rearrange: } 2x - 6y = 16$$

$$\text{add: } 7x = 35$$

$$\text{sub } x = 5 \text{ into (1): } 2 \times 5 - 6y = 16$$

$$x = 5, y = -1$$

2 / 2

39 Stickers are sold in small packs and in large packs.

There is a total of 148 stickers in 5 small packs and 3 large packs.

There is a total of 171 stickers in 6 small packs and 3 large packs.

Work out the number of stickers in each small pack and in each large pack.

let small pack = s , large pack = b

$$5s + 3b = 148$$

$$6s + 3b = 171$$

$$(1) \times 6: 30s + 18b = 888$$

$$(2) \times 5: 30s + 15b = 855$$

$$\text{subtract: } 3b = 33$$

$$b = 11$$

$$s = 23$$

Small 23, Large 11

3 / 3

40 Solve the simultaneous equations

$$5x + 3y = 4.5$$

$$2x - 3y = 27$$

$$(1) \times 2: 10x + 6y = 9$$

$$(2) \times 5: 10x - 15y = 135$$

$$\text{subtract: } 21y = -126$$

$$x = 4.5, y = -6$$

3 / 3

41 Solve the simultaneous equations

$$2x - 3y = 29$$

$$x = -8 - 3y$$

$$\text{rearrange: } x + 3y = -8$$

$$\text{add: } 3x = 21$$

$$\text{sub } x = 7 \text{ into (1): } 7 + 3y = -8$$

$$x = 7, y = -5$$

3 / 3

42 In a kiosk, 4 pens and 5 notebooks cost £25.20.

In the same kiosk, 4 pens and 1 notebook cost £11.60.

Work out the price of one pen and the price of one notebook.

$$\text{let pen} = c, \text{ notebook} = k$$

$$4c + 5k = 25.20$$

$$4c + k = 11.60$$

$$\text{subtract: } 4k = 13.60$$

$$k = 3.40$$

$$c = 2.05$$

$$\text{Pen } £2.05, \text{ Notebook } £3.40$$

3 / 3

- 43 Solve the simultaneous equations

$$4x - 5y = 3.5$$

$$x - 2y = 2$$

$$(2) \times 4: 4x - 8y = 8$$

$$\text{subtract: } 3y = -4.5$$

$$x = -1, y = -1.5$$

3 / 3

- 44 Solve the simultaneous equations

$$5x = -25 + 5y$$

$$2x + 4y - 2 = 0$$

$$\text{rearrange: } 2x + 4y = 2$$

$$5x - 5y = -25$$

$$(1) \times 5: 10x + 20y = 10$$

$$(2) \times 4: 20x - 20y = -100$$

$$\text{add: } 30x = -90$$

$$\text{sub } x = -3 \text{ into } (1): 2 \times (-3) + 4y = 2$$

$$x = -3, y = 2$$

3 / 3

- 45 In a kiosk, 2 coffees and 3 cakes cost £5.75.

In the same kiosk, 3 coffees and 5 cakes cost £8.90.

Work out the price of one coffee and the price of one cake.

$$\text{let coffee} = c, \text{ cake} = k$$

$$2c + 3k = 5.75$$

$$3c + 5k = 8.90$$

$$(1) \times 3: 6c + 9k = 17.25$$

$$(2) \times 2: 6c + 10k = 17.80$$

$$\text{subtract: } k = 0.55$$

$$c = 2.05$$

$$\text{Coffee } £2.05, \text{ Cake } £0.55$$

3 / 3

46 Solve the simultaneous equations

$$3x - 2y = 2.5$$

$$3x - 3y = -4.5$$

subtract: $y = 7$

$$x = 5.5, y = 7$$

3 / 3

47 Solve the simultaneous equations

$$4x - y - 15 = 0$$

$$7x = 33 + 4y$$

rearrange: $4x - y = 15$

$$7x - 4y = 33$$

$$(1) \times 4: 16x - 4y = 60$$

$$\text{subtract: } 9x = 27$$

$$\text{sub } x = 3 \text{ into (1): } 4 \times 3 - y = 15$$

$$x = 3, y = -3$$

3 / 3

48 Solve the simultaneous equations

$$6x + y - 17 = 0$$

$$x + 4y + 1 = 0$$

rearrange: $x + 4y = -1$

$$6x + y = 17$$

$$(2) \times 4: 24x + 4y = 68$$

$$\text{subtract: } -23x = -69$$

$$\text{sub } x = 3 \text{ into (1): } 3 + 4y = -1$$

$$x = 3, y = -1$$

3 / 3

49 Solve the simultaneous equations

$$x = -21 - 3y$$

$$3y + 3 = 5x$$

rearrange: $x + 3y = -21$

$$5x - 3y = 3$$

add: $6x = -18$

sub $x = -3$ into (1): $(-3) + 3y = -21$

$$x = -3, y = -6$$

3

 / 3

50 Solve the simultaneous equations

$$6x + y - 17 = 0$$

$$6x - y - 19 = 0$$

rearrange: $6x + y = 17$

$$6x - y = 19$$

add: $12x = 36$

sub $x = 3$ into (1): $6 \times 3 + y = 17$

$$x = 3, y = -1$$

3

 / 3