SIMULTANEOUS EQUATIONS – PRACTICE QUESTIONS

1.
Solve the simultaneous equations:
$2x + 5y = 9$
$-\ 2x + 3y = 7$

$2y = 2$
$y = 1$

$2x + 3 \times 1 = 7$
$2x + 3 = 7$ -3 -3
$2x = 4$ $\div 2$ $\div 2$
$x = 2$

$y = 1$
$x = 2$

2.
Solve the simultaneous equations:
$3x + 4y = 23$
$+\ 2x - 4y = 2$

$5x = 25$
$x = 5$

$3 \times 5 + 4y = 23$
$15 + 4y = 23$ -15 -15
$4y = 8$ $\div 4$ $\div 4$
$y = 2$

$x = 5$
$y = 2$

3.
Solve the simultaneous equations:
$7x + 2y = 33$
$-\ 4x + 2y = 24$

$3x = 9$
$x = 3$

$4 \times 3 + 2y = 24$
$12 + 2y = 24$ -12 -12
$2y = 12$ $\div 2$ $\div 2$
$y = 6$

$x = 3$
$y = 6$

4.
Solve the simultaneous equations:

$10x + y = 29$

$-\ 7x + y = 20$

$3x = 9$

$x = 3$

$7 \times 3 + y = 20$

$21 + y = 20$

$-21 \qquad -21$

$y = -1$

$x = 3$
$y = -1$

5.
Solve the simultaneous equations:

$3x + 2y = 17$

$+\ 5x - 2y = 7$

$8x = 24$

$x = 3$

$3 \times 3 + 2y = 17$

$9 + 2y = 17$

$-9 \qquad -9$

$2y = 8$

$\div 2 \qquad \div 2$

$y = 4$

$x = 3$
$y = 4$

6.
Solve the simultaneous equations:

$4x + 5y = 13$

$-\ 4x - 3y = 5$

$8y = 8$

$y = 1$

$4x + 5 \times 1 = 13$

$4x + 5 = 13$

$-5 \qquad -5$

$4x = 8$

$\div 4 \qquad \div 4$

$x = 2$

$y = 1$
$x = 2$

7.
Solve the simultaneous equations:

$3x + 5y = 19$

$+\ 7x - 5y = 11$

$10x = 30$

$x = 3$

$3 \times 3 + 5y = 19$

$9 + 5y = 19$

$-9 \qquad -9$

$5y = 10$

$\div 5 \qquad \div 5$

$y = 2$

$x = 3$
$y = 2$

8.
Solve the simultaneous equations:
$5x + 2y = 17$
$4x + y = 10$ $\times 2$

$$8x + 2y = 20$$
$$-\ 5x + 2y = 17$$
$$3x = 3$$
$$x = 1$$

$4 \times 1 + y = 10$
$4 + y = 10$ -4 -4
$y = 6$

$x = 1$
$y = 6$

9.
Solve the simultaneous equations:
$6x + 5y = 13$
$2x + 3y = 3$ $\times 3$

$$6x + 9y = 9$$
$$-\ 6x + 5y = 13$$
$$4y = -4$$
$$y = -1$$

$2x + 3 \times -1 = 3$
$2x - 3 = 3$ $+3$ $+3$
$2x = 6$ $\div 2$ $\div 2$
$x = 3$

$y = -1$
$x = 3$

10.
Solve the simultaneous equations:
$3x + 2y = 23$
$4x - y = 16$ $\times 2$

$$8x - 2y = 32$$
$$+\ 3x + 2y = 23$$
$$11x = 55$$
$$x = 5$$

$4 \times 5 - y = 16$
$20 - y = 16$
$y = 4$

$x = 5$
$y = 4$

11.
Solve the simultaneous equations:

$4x + 3y = 10$ $\times 2$ $8x + 6y = 20$
$3x + 2y = 7$ $\times 3$ $9x + 6y = 21$

$-8x + 6y = 20$

$x = 1$

$3 \times 1 + 2y = 7$
$3 + 2y = 7$
$-3 \quad -3$
$2y = 4$
$\div 2 \quad \div 2$
$y = 2$

$x = 1$
$y = 2$

12.
Solve the simultaneous equations:

$3x + 5y = 14$ $\times 2$ $6x + 10y = 28$
$2x + 3y = 9$ $\times 3$ $-6x + 9y = 27$

$y = 1$

$2x + 3 \times 1 = 9$
$2x + 3 = 9$
$-3 \quad -3$
$2x = 6$
$\div 2 \quad \div 2$
$x = 3$

$y = 1$
$x = 3$

13.
Solve the simultaneous equations:

$3x + 4y = 11$ $\times 3$ $9x + 12y = 33$
$7x - 3y = 1$ $\times 4$ $+ 28x - 12y = 4$

$37x = 37$
$x = 1$

$3 \times 1 + 4y = 11$
$3 + 4y = 11$
$-3 \quad -3$
$4y = 8$
$\div 4 \quad \div 4$
$y = 2$

$x = 1$
$y = 2$

14.

Solve the simultaneous equations:

$7x + 3y = 27$ $\times 2$ $\quad 14x + 6y = 54$

$3x - 2y = 5$ $\times 3$ $+ \; 9x - 6y = 15$

$23x = 69$

$x = 3$

$7 \times 3 + 3y = 27$

$21 + 3y = 27$ $\quad -21 \quad -21$

$3y = 6$ $\quad \div 3 \quad \div 3$

$y = 2$

$x = 3$

$y = 2$

15.

Solve the simultaneous equations:

$5x + 6y = 13$ $\times 2$ $\quad 10x + 12y = 26$

$3x + 4y = 8$ $\times 3$ $- \; 9x + 12y = 24$

$x = 2$

$3 \times 2 + 4y = 8$

$6 + 4y = 8$ $\quad -6 \quad -6$

$4y = 2$ $\quad \div 4 \quad \div 4$

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

$= \frac{1}{2}$

$x = 2$

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

16.

Solve the simultaneous equations:

$2x + 5y = 21$ $\times 3$ $\quad 6x + 15y = 63$

$3x - 7y = 17$ $\times 2$ $- \; 6x - 14y = 34$

$29y = 29$

$y = 1$

$2x + 5 \times 1 = 21$

$2x + 5 = 21$ $\quad -5 \quad -5$

$2x = 16$ $\quad \div 2 \quad \div 2$

$x = 8$

$y = 1$

$x = 8$

17.
Solve the simultaneous equations:
$9x - 5y = 30$
$+\ 2x + 5y = 25$

$11x = 55$
$x = 5$

$2 \times 5 + 5y = 25$
$10 + 5y = 25$
$-10 \quad -10$
$5y = 15$
$\div 5 \quad \div 5$
$y = 3$

$x = 5$
$y = 3$

18.
Solve the simultaneous equations:
$5x + 8y = 19$
$3x + 4y = 9$ $\times 2$

$6x + 8y = 18$
$-\ 5x + 8y = 19$
$x = -1$

$3x - 1 + 4y = 9$
$+3 \quad -3 + 4y = 9 \quad +3$
$\div 4 \quad 4y = 12 \quad \div 4$
$y = 3$

$x = -1$
$y = 3$

19.
Solve the simultaneous equations:
$8x - 3y = 12$ $\times 2$
$3x + 2y = 17$ $\times 3$

$16x - 6y = 24$
$+\ 9x + 6y = 51$
$25x = 75$
$x = 3$

$3 \times 3 + 2y = 17$
$-9 \quad 9 + 2y = 17 \quad -9$
$\div 2 \quad 2y = 8 \quad \div 2$
$y = 4$

$x = 3$
$y = 4$

20.
Solve the simultaneous equations:
$10x + 4y = 32$
$-\ 3x + 4y = 4$

$7x = 28$
$x = 4$

$3 \times 4 + 4y = 4$
$12 + 4y = 4$
$-12 \quad -12$
$\div 4 \quad 4y = -8 \quad \div 4$
$y = -2$

$x = 4$
$y = -2$

21.

Solve the simultaneous equations:

$5x - 3y = 24$ $\times 2$ $\quad 10x - 6y = 48$

$3x + 2y = 3$ $\times 3$ $+ \; 9x + 6y = 9$

$19x = 57$

$x = 3$

$3 \times 3 + 2y = 3$

$9 + 2y = 3$

$-9 \quad -9$

$2y = -6$

$\div 2 \quad \div 2$

$y = -3$

$x = 3$

$y = -3$

22.

Solve the simultaneous equations:

$6x + 7y = 11$ $\times 2$ $\quad 12x + 14y = 22$

$4x + 3y = 9$ $\times 3$ $- \; 12x + 9y = 27$

$5y = -5$

$y = -1$

$4x + 3x - 1 = 9$

$4x - 3 = 9$

$+3 \quad +3$

$4x = 12$

$\div 4 \quad \div 4$

$x = 3$

$y = -1$

$x = 3$

23.

Solve the simultaneous equations:

$10x + 9y = 23$ $\quad 10x + 9y = 23$

$5x - 3y = 34$ $\times 3$ $+ \; 15x - 9y = 102$

$25x = 125$

$x = 5$

$10 \times 5 + 9y = 23$

$50 + 9y = 23$

$-50 \quad -50$

$9y = -27$

$\div 9 \quad \div 9$

$y = -3$

$x = 5$

$y = -3$

24.
A café sells baguettes and sandwiches.
The first customer buys 3 baguettes and 4 sandwiches for £27.
The second customer buys 2 baguettes and 3 sandwiches for £19.

Find the cost of each item.

$3b + 4s = 27 \quad \times 2$
$2b + 3s = 19 \quad \times 3$

$6b + 8s = 54$
$6b + 9s = 57$
$-\ 6b + 8s = 54$
$s = 3$

$2b + 3 \times 3 = 19$
$2b + 9 = 19$ $\quad -9 \quad -9$
$2b = 10$ $\quad \div 2 \quad \div 2$
$b = 5$

baguette = £5
sandwich = £3

25.
A grocer sells apples and bananas.
The cost of 3 apples and 4 bananas is £1.90.
The cost of 7 apples and 3 bananas is £2.85.

Find the cost of each item.

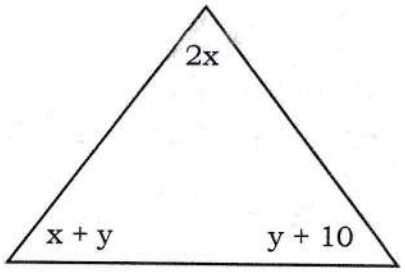
$3a + 4b = 190 \quad \times 3$
$7a + 3b = 285 \quad \times 4$

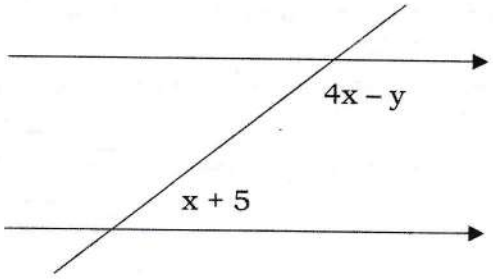
$9a + 12b = 570$
$28a + 12b = 1140$
$-\ 9a + 12b = 570$
$19a = 570$
$a = 30$

$3 \times 30 + 4b = 190$
$90 + 4b = 190$ $\quad -90 \quad -90$
$4b = 100$ $\quad \div 4 \quad \div 4$
$b = 25$

apple = 30p
banana = 25p

26.
Find x and y.





$2x + x + y + y + 10 = 180$
$3x + 2y + 10 = 180$
$3x + 2y = 170$

$4x - y + x + 5 = 180$
$5x - y + 5 = 180$
$5x - y = 175$

$3x + 2y = 170$
$5x - y = 175 \quad \times 2$

$10x - 2y = 350$
$+ \quad 3x + 2y = 170$
$13x = 520$
$x = 40$

$3 \times 40 + 2y = 170$
$120 + 2y = 170$
$2y = 50$
$y = 25$

$x = 40°$
$y = 25°$

27.
50 tickets were sold for a concert.
Adult tickets cost £5 and child tickets cost £2.
The total money taken from the sale of the tickets was £160.

Find the number of child tickets sold and the number of adult tickets sold.

$5a + 2c = 160$
$a + c = 50$ $\times 2$

$5a + 2c = 160$
$-\ 2a + 2c = 100$
$3a = 60$
$a = 20$

$20 + c = 50$
$c = 30$

adult tickets = 20
child tickets = 30

28.
A football team played 35 games last season.
The team receives 3 points for a win, 1 point for a draw and no points for a loss.
The team lost 9 games and ended the season with 58 points.

Find how many wins and draws the team had last season.

$35 - 9 = 26$

$3w + d = 58$
$-\ w + d = 26$
$2w = 32$
$w = 16$

$16 + d = 26$
$d = 10$

wins = 16
draws = 10