Today's Learning:

Solving Simultaneous Equations by elimination.

① $T + B = 6$

② $T - B = 4$

Add

$2T = 10$

$T = 5$

use ① $T + B = 6$

$5 + B = 6$

$-5 \quad -5$

$B = 1$

Solving by elimination:

① $2y + x = 5$

② $4y - x = 7$

Add

$6y = 12$

$y = 2$

use ① $2y + x = 5$

$4 + x = 5$

$-4 \quad -4$

$x = 1$

$x = 1$

$y = 2$

$4b + 2c = 50$ ①

$2b + 2c = 30$ ②

① $4b + 2c = 50$

$-1 \times$ ② $-2b - 2c = -30$

Add

$2b = 20$

$b = 10$ ✓

use ① $4b + 2c = 50$

$40 + 2c = 50$

$-40 \quad -40$

$2c = 10$

$c = 5$ ✓

$8p + 6q = 2$ ①

$8p + 5q = -1$ ②

① $8p + 6q = 2$

$-1 \times$ ② $-8p - 5q = 1$

Add

$q = 3$ ✓

use ① $8p + 6q = 2$

$8p + 18 = 2$

$-18 \quad -18$

$8p = -16$

$p = -2$ ✓

$6b + a = 5$ ①

$-6b + 4a = 5$ ②

Add

$5a = 10$

$a = 2$

use ①

$6b + 2 = 5$

$-2 \quad -2$

$6b = 3$

$\div 6 \quad \div 6$

$b = \frac{3}{6} = \frac{1}{2}$

$5a + 4b = 42$ ①

$2a + 4b = 12$ ②

$-1 \times$ ① $-5a - 4b = -42$

② $2a + 4b = 12$

Add

$3a = -30$

$a = -10$ ✓

use ② $-20 + 4b = 12$

$+20 \quad +20$

$4b = 32$

$\div 4 \quad \div 4$

$b = 8$ ✓

$4b + c = 21$ ①

$2b + 3c = 13$ ②

$-3 \times$ ① $-12b - 3c = -63$

② $2b + 3c = 13$

Add

$-10b = -50$

$b = 5$ ✓

use ② $2b + 3c = 13$

$10 + 3c = 13$

$-10 \quad -10$

$3c = 3$ ✓

$c = 1$

$$6a + 2b = 5 \quad (1)$$

$$2a + 10b = 11 \quad (2)$$

(1) $6a + 2b = 5$

$-3\times(2)$ $-6a - 30b = -33$

$-28b = -28$

$b = 1$ ✓

use (1)

$6a + 2b = 5$

$6a + 2 = 5$

$-2 \quad -2$

$6a = 3$

$\div 6 \quad \div 6$

$a = \frac{3}{6} = \frac{1}{2}$ ✓

$$2a + 3b = 40 \quad (1)$$
$$3a + 2b = 35 \quad (2)$$

$2\times(1)$ $4a + 6b = 80$

$-3\times(2)$ $-9a - 6b = -105$

Add

$-5a = -25$

$a = 5$

use (1) $2a + 3b = 40$

$10 + 3b = 40$

$-10 \quad -10$

$3b = 30$

$b = 10$

Solving Simultaneous Equations

- ☆ Label the equations
- ☆ Multiply each equation so you can cancel something out
- ☆ Add the equations together
- ☆ Solve
- ☆ Substitute to find the other unknown

e.g. 1) 7b - 5c = 35 ①
9b - 4c = 45 ②

$-4 \times$ ① $-28b + 20c = -140$
$5 \times$ ② $45b - 20c = 225$
Add

$17b = 85$
$\div 17 \quad \div 17$
$b = 5$

use ① $7b - 5c = 35$
$35 - 5c = 35$
$-35 \quad -35$
$-5c = 0$
$c = 0$

2) $2x + 3y = 7$ ①
$4x + 5y = 12$ ②

$-2 \times$ ① $-4x - 6y = -14$
② $4x + 5y = 12$
$+$
$-y = -2$
$y = 2$

Use ① $2x + 3y = 7$
$2x + 6 = 7$
$-6 \quad -6$
$2x = 1$
$x = \frac{1}{2}$

Today's Learning:

To practise exam type questions on simultaneous equations.

$4a + 3b = 22$ ① $\times 4$

$12a - 4b = 40$ ② $\times 3$

$4 \times$ ① $16a + 12b = 88$

$3 \times$ ② $36a - 12b = 120$

Add

$52a = 208$

$\div 52 \quad \div 52$

$a = 4$

use ② $12a - 4b = 40$

$48 - 4b = 40$

$-48 \quad -48$

$-4b = -8$

$\div -4 \quad \div -4$

$b = 2$

$a = 4$

$b = 2$

Exam Questions

Two burgers and a milkshake cost £8.40. Three burgers and two milkshakes cost £13.55. By forming a pair of simultaneous equations, find the cost of burgers and milkshakes.

$2b + m = 8.4$ ①

$3b + 2m = 13.55$ ②

$-2 \times$ ① $-4b - 2m = -16.8$

② $3b + 2m = 13.55$

Add

$-b = -3.25$

$b = 3.25$

use ① $2b + m = 8.4$

$2 \times 3.25 + m = 8.4$

$6.5 + m = 8.4$

$m = 1.9$

Burger £3.25

Milkshake £1.90