

# SIMULTANEOUS EQUATIONS I



## Lesson 1

### GCSE Mathematics Simultaneous Equations I

#### 1.1 Exploring The Algebra

Consider the equation,

$$y + x = 8$$

There are many values of  $x$  and  $y$  that make this true.

For example,  $x = 7$  and  $y = 1$  which could be conveniently written  $(7, 1)$

#### Question

List four more pairs of values that make the equation  $y + x = 8$  true.



Now consider this second equation,

$$y - x = 4$$

Again, there are many values of  $x$  and  $y$  that make this true.

For example,  $x = 10$  and  $y = 6$  which could be written  $(10, 6)$

#### Question

List four more pairs of values that make the equation  $y - x = 4$  true.



#### 1.2 The Special Pair

There is one special pair of values,  $(x, y)$ , that make both equations true.

#### Question

Experiment until the pair that makes both of the equations  $\left. \begin{array}{l} y + x = 8 \\ y - x = 4 \end{array} \right\}$  true is found.



Solving equations simultaneously is a mathematical method for locating any pairs of values,  $(x, y)$ , that satisfy a system of equations.

### 1.3 Exercise

Marks Available : 24

Solve the following pairs of equations simultaneously by adding the equations.

#### Question 1

$$\left. \begin{array}{l} y + x = 14 \\ y - x = 10 \end{array} \right\}$$

[ 3 marks ]

#### Question 2

$$\left. \begin{array}{l} 5y + 3x = 29 \\ 3y - 3x = 3 \end{array} \right\}$$

[ 3 marks ]

#### Question 3

$$\left. \begin{array}{l} 7y + 2x = 22 \\ 5y - 2x = 2 \end{array} \right\}$$

[ 3 marks ]

#### Question 4

$$\left. \begin{array}{l} 3y + 6x = 36 \\ -3y + 2x = 4 \end{array} \right\}$$

[ 3 marks ]

**Question 5**

$$\left. \begin{array}{l} 3y + 3x = 48 \\ -3y + 2x = 12 \end{array} \right\}$$

[ 3 marks ]

**Question 6**

$$\left. \begin{array}{l} 8y + 4x = 16 \\ 5y - 4x = 23 \end{array} \right\}$$

[ 3 marks ]

**Question 7**

$$\left. \begin{array}{l} 3y + 2x = -2 \\ 2y - 2x = -18 \end{array} \right\}$$

[ 3 marks ]

**Question 8**

$$\left. \begin{array}{l} 4y + 4x = -32 \\ y - 4x = 17 \end{array} \right\}$$

[ 3 marks ]

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