



1. Equations and inequalities: Simultaneous equations

1. Solve these simultaneous equations by elimination.

- (a) $2x - y = 6, 4x + 3y = 22$
(b) $3x - 2y = -6, 6x + 3y = 2$

2. Solve these simultaneous equations by substitution.

- (a) $x + 3y = 11, 4x - 7y = 6$
(b) $2y = 2x - 3, 3y = x - 1$

3. $3x + ky = 8, x - 2ky = 5$ are simultaneous equations where k is a constant.

- (a) Show that $x = 3$
(b) Given that $y = \frac{1}{2}$, determine the value of k

4. Solve the following pairs of simultaneous equations.

- (a) $y = 1 - x, y^2 - xy = 0$
(b) $y = 3x, 2y^2 - xy = 15$
(b) $y = 3x - 11, x^2 + 2xy + 3 = 0$

5. Find the co-ordinates of the points of intersection of the straight line $y + 2x = 3$ and curve $2x^2 - 3xy = 14$

6. (a) By eliminating y from the equations $y = 2 - 4x$ and $3x^2 + xy + 11 = 0$, show that $x^2 - 2x - 11 = 0$.

(b) Hence, or otherwise, solve the simultaneous equations $y = 2 - 4x, 3x^2 + xy + 11 = 0$, giving your answers in the form $a \pm b\sqrt{3}$, where a and b are integers.

7. Solve $3x - 2y + 5 = 0, 5(x + y) = 6(x + 1)$

8*. Solve the following set of equations: $x + y = 7, x^3 + y^3 = 133$.



6. Equations and inequalities: Simultaneous equations

1. Solve these simultaneous equations by elimination.

(a) $2x - y = 6, 4x + 3y = 22$ $x = 4, y = 2$

(b) $3x - 2y = -6, 6x + 3y = 2$ $x = -\frac{2}{3}, y = 2$

2. Solve these simultaneous equations by substitution.

(a) $x + 3y = 11, 4x - 7y = 6$ $x = 5, y = 2$

(b) $2y = 2x - 3, 3y = x - 1$ $x = \frac{7}{4}, y = \frac{1}{4}$

3. $3x + ky = 8, x - 2ky = 5$ are simultaneous equations where k is a constant.

(a) Show that $x = 3$ **Multiply the first equation by 2 and then use elimination**

(b) Given that $y = \frac{1}{2}$, determine the value of k $k = -2$

4. Solve the following pairs of simultaneous equations.

(a) $y = 1 - x, y^2 - xy = 0$ $x = 1, y = 0$ or $x = \frac{1}{2}, y = \frac{1}{2}$

(b) $y = 3x, 2y^2 - xy = 15$ $x = -1, y = -3$ or $x = 1, y = 3$

(b) $y = 3x - 11, x^2 + 2xy + 3 = 0$ $x = 3, y = -2$ or $x = \frac{1}{7}, y = -10\frac{4}{7}$

5. Find the co-ordinates of the points of intersection of the straight line $y + 2x = 3$ and curve $2x^2 - 3xy = 14$ $(2, -1)$ and $(-\frac{7}{8}, 4\frac{3}{4})$

6. (a) By eliminating y from the equations $y = 2 - 4x$ and $3x^2 + xy + 11 = 0$, show that $x^2 - 2x - 11 = 0$.

(b) Hence, or otherwise, solve the simultaneous equations $y = 2 - 4x, 3x^2 + xy + 11 = 0$, giving your answers in the form $a \pm b\sqrt{3}$, where a and b are integers. $x = 1 + 2\sqrt{3}, y = -2 - 8\sqrt{3}$ or $x = 1 - 2\sqrt{3}, y = -2 + 8\sqrt{3}$

7. Solve $3x - 2y + 5 = 0, 5(x + y) = 6(x + 1)$ $x = -1, y = 1$

8*. Solve the following set of equations: $x + y = 7, x^3 + y^3 = 133$. $x = 5, y = 2$ or $x = 2, y = 5$