# Advanced Simultaneous Equations

**1** Solve the simultaneous equations:

**a** $x + y = 11$
  $xy = 30$

**b** $2x + y = 1$
  $x^2 + y^2 = 1$

**c** $y = 3x$
  $2y^2 - xy = 15$

**d** $x + y = 9$
  $x^2 - 3xy + 2y^2 = 0$

**e** $3a + b = 8$
  $3a^2 + b^2 = 28$

**f** $2u + v = 7$
  $uv = 6$

**2** Find the coordinates of the points at which the line with equation $y = x - 4$ intersects the curve with equation $y^2 = 2x^2 - 17$.

**3** Find the coordinates of the points at which the line with equation $y = 3x - 1$ intersects the curve with equation $y^2 - xy = 15$.

**4** Solve the simultaneous equations:

**a** $3x + 2y = 7$
  $x^2 + y = 8$

**b** $2x + 2y = 7$
  $x^2 - 4y^2 = 8$

**5** Solve the simultaneous equations, giving your answers in their simplest surd form:

**a** $x - y = 6$
  $xy = 4$

**b** $2x + 3y = 13$
  $x^2 + y^2 = 78$