# AQA Level 2 Further mathematics Further algebra

## Section 1: Equations

### Exercise

1. Solve the following equations:
   (i) $2x - 3 = 8$ (ii) $3y + 2 = y - 5$
   (iii) $3 - 2a = 3a - 1$ (iv) $3(p - 3) = 2(2p + 1)$
   (v) $2(1 - z) + 3(z + 3) = 4z + 1$ (vi) $\frac{2b+1}{5} = \frac{3-b}{4}$

2. The largest angle of a triangle is three times as big as the smallest angle.
   The third angle is 20° greater than the smallest angle.
   Find all three angles of the triangle.

3. In a restaurant, there are 24 tables, some of which seat four people, and the rest seat 6 people. The restaurant can hold 114 people altogether.
   How many tables seat four people?

4. Lien is doing a Statistics project on the heights of students in her class.
   She has written:
   Mean height of boys = 165 cm
   Mean height of girls = 159 cm
   Mean height of whole class = 162.2 cm
   There are 30 students in Lien's class.
   How many boys and how many girls are there?

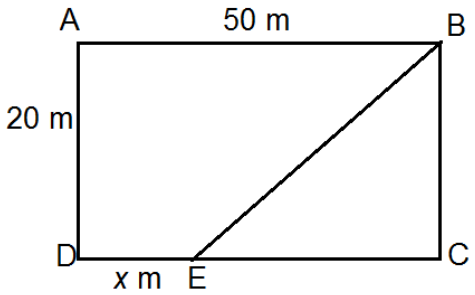
5. Solve these quadratic equations by factorising.
   (i) $x^2 + 4x + 3 = 0$ (ii) $x^2 + 5x - 6 = 0$
   (iii) $x^2 - 6x + 8 = 0$ (iv) $x^2 - 7x - 18 = 0$
   (v) $2x^2 + 5x + 3 = 0$ (vi) $2x^2 + x - 6 = 0$
   (vii) $4x^2 - 3x - 10 = 0$ (viii) $6x^2 - 19x + 10 = 0$

6. Solve the following quadratic equations, where possible. Give answers in exact form.
   (i) $x^2 + 2x - 2 = 0$ (ii) $x^2 - 3x + 5 = 0$
   (iii) $2x^2 + x - 4 = 0$ (iv) $2x^2 - 5x - 12 = 0$
   (v) $x^2 - 5x - 3 = 0$ (vi) $3x^2 + x + 1 = 0$
   (vii) $4x^2 + 12x + 9 = 0$ (viii) $4x^2 + 10x + 5 = 0$

7. The length of a rectangle is 3 cm greater than its width. The area of the rectangle is 40 cm². Find the length and width of the rectangle.

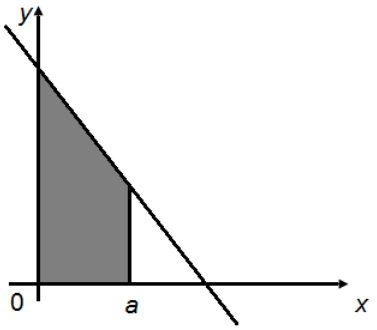
# AQA FM Further algebra 1 Exercise

8. ABCD is a rectangular field with width 20 m and length 50 m. Alistair walks from D to B by walking a distance of $x$ m along DC to E then walking to B in a straight line.




The total distance which Alistair walks is 60 m. Find the value of $x$.

9. The area between the $x$-axis, the $y$-axis, the line $y = 5 - 2x$ and the line $x = a$ is shaded in the diagram below.




The shaded area is 3 square units.

a) Show that $0 < a < 2.5$

b) Find the exact value of $a$.