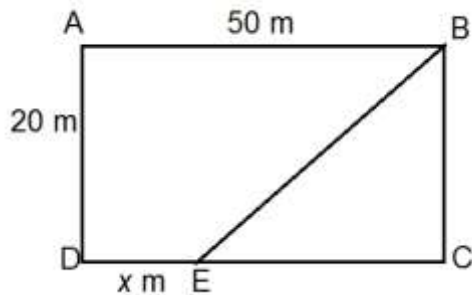


## Section 1: Solving linear and quadratic equations

### Exercise

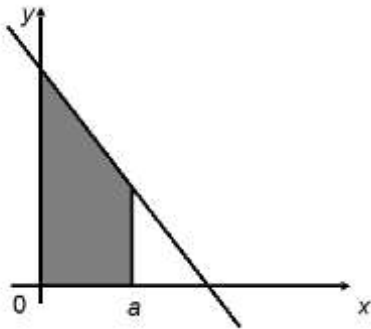
- Solve the following equations:
  - $2x - 3 = 8$
  - $3y + 2 = y - 5$
  - $3 - 2a = 3a - 1$
  - $3(p - 3) = 2(2p + 1)$
  - $2(1 - z) + 3(z + 3) = 4z + 1$
  - $\frac{2b+1}{5} = \frac{3-b}{4}$
- The largest angle of a triangle is three times as big as the smallest angle. The third angle is  $20^\circ$  greater than the smallest angle. Find all three angles of the triangle.
- 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?
- 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?
- Solve these quadratic equations by factorising.
  - $x^2 + 4x + 3 = 0$
  - $x^2 + 5x - 6 = 0$
  - $x^2 - 6x + 8 = 0$
  - $x^2 - 7x - 18 = 0$
  - $2x^2 + 5x + 3 = 0$
  - $2x^2 + x - 6 = 0$
  - $4x^2 - 3x - 10 = 0$
  - $6x^2 - 19x + 10 = 0$
- Solve the following quadratic equations, where possible. Give answers in exact form.
  - $x^2 + 2x - 2 = 0$
  - $x^2 - 3x + 5 = 0$
  - $2x^2 + x - 4 = 0$
  - $2x^2 - 5x - 12 = 0$
  - $x^2 - 5x - 3 = 0$
  - $3x^2 + x + 1 = 0$
  - $4x^2 + 12x + 9 = 0$
  - $4x^2 + 10x + 5 = 0$
- The length of a rectangle is 3 cm greater than its width. The area of the rectangle is  $40 \text{ cm}^2$ . Find the length and width of the rectangle.

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.

- Show that  $0 < a < 2.5$
- Find the exact value of  $a$ .