

## 4.7 Collecting like terms and solving equations

- Activity**
- Work in groups: Put an equal number of pencils in 3 tins and tell your partner that you have 30 pencils altogether.
  - Ask him to find out the number of pencils each tin had.

### Example 1

Solve:

$$3g + g + 2g = 30$$

$$3g + g + 2g = 30$$

$$6g = 30$$

$$\frac{1 \cancel{6}g}{1 \cancel{6}} = \frac{\cancel{30}^5}{\cancel{6}_1}$$

$$g = 5$$

### Example 2

Solve:

$$4y - 3 = y + 6$$

$$4y - 3 + 3 = y + 6 + 3$$

$$4y - y = y - y + 9$$

$$3y = 9$$

$$\frac{1 \cancel{3}y}{1 \cancel{3}} = \frac{\cancel{9}^3}{\cancel{3}_1}$$

$$y = 3$$

### Example 3

Musa is twice as old as Anna. Their total age is 18 years. How old is Anna?

Let Anna's age be  $x$ .

Anna	Musa	Total
$x$ years	$2x$ years	18 years

So,  $x + 2x = 18$  years.

Therefore,

$$x + 2x = 18 \text{ years}$$

$$3x = 18$$

$$\frac{1 \cancel{3}x}{1 \cancel{3}} = \frac{\cancel{18}^6}{\cancel{3}_1}$$

$$x = 6$$

### Aid to memory

- Always collect like terms before solving equations.

**Exercise 12.12:** Collect like terms and solve:

- $p + 5p + 2p = 40$
- $5(a - 1) - 3(a - 3) = 20$
- $6(n + 4) = 3(n - 2)$
- Kyenge's age is three times Kato's age. If their total age is 20 years, what is Kato's age?
- A mother is 4 times as old as her daughter. Their total age is 30 years. Find the daughter's age.
- Apio weighs  $3x$  kg and Odeke weighs  $4x$  kg. If their total weight is 140 kg, find Apio's weight.
- A mother is 3 times as old as her daughter. Their total age is 48 years. How old is the daughter?

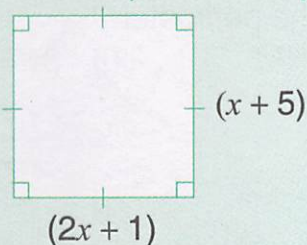
## 4.8 Solving equations formed from polygons

**Activity** ■ Work in pairs: Using a ruler, measure, record and compare the opposite sides of your (a) desk (b) book.

### Example 1

Find the value of  $x$ .

The sides of a square are equal.

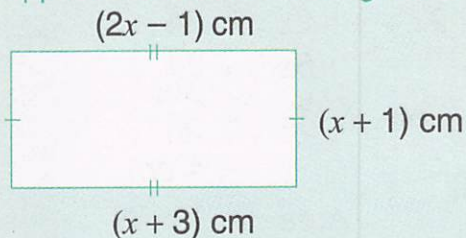


$$\begin{aligned} 2x + 1 &= x + 5 \\ 2x + 1 - 1 &= x + 5 - 1 \\ 2x &= x + 4 \\ 2x - x &= x - x + 4 \\ x &= 4 \end{aligned}$$

### Example 2

Find the value of  $x$  and the sides of the figure.

Opposite sides of a rectangle are equal.



$$\begin{aligned} 2x - 1 &= x + 3 \\ 2x - 1 + 1 &= x + 3 + 1 \\ 2x &= x + 4 \\ 2x - x &= x - x + 4 \\ x &= 4 \text{ cm} \end{aligned}$$

$$\text{Length} = x + 3 = 4 + 3 = 7 \text{ cm}$$

$$\text{Width} = x + 1 = 4 + 1 = 5 \text{ cm}$$

### Aid to memory

■ The equal sides of a figure are indicated using the same mark.

### Exercise 12.13:

Find the value of  $x$  in the figures below:

