Formulae

- Writing formulae using words
- Writing formulae using symbols
- Using formulae to solve problems

Keywords

You should know

explanation 1

1 Paul downloads some music. He uses this formula.

> cost of downloads = cost of one song × number of songs downloaded

Paul downloads 5 songs. Each song costs 80p.
Use Paul's formula to work out the cost of the downloads.

2 David wants to work out if he has enough money to pay for a trip to the cinema. He uses this formula.

> total cost = cost of return bus ticket + cost of cinema ticket

The cost of a return bus ticket is £1.65. The cost of a cinema ticket is £3.85.

Use David's formula to work out the total cost of a trip to the cinema.

3 Dina works part time in the local shop. She uses this formula.

> total pay = pay per hour × number of hours worked

Dina works for 4 hours on a Saturday. She is paid £6.50 per hour.

Use Dina's formula to work out her total pay for working on Saturday.

4 Jamal buys a box of chocolates. He uses this formula.

> cost of each chocolate = cost of the box ÷ number of chocolates

Jamal paid £2.50 for the box of chocolates. The box contains 25 chocolates.

Use Jamal's formula to work out the cost of each chocolate.

explanation 2

5 Philip and Heidi are raising money for charity.

Philip raises £P and Heidi raises £H.
The total amount of money they raise is £T.

   a Write a word formula for the total amount of money they raise.

   b Write a formula using the letters T, P and H.

   c $P = 96$ and $H = 108$. Find the value of T.

6 Adam and Nicole are sharing out some badges.

Adam takes A badges. There are B badges altogether. Nicole has N badges.

   a Write a word formula for the number of badges that Nicole has.

   b Write a formula using the letters N, B and A.

   c $B = 60$ and $A = 25$. Find the value of N.

7 Jason has a bag of sweets and decides to share them with his friends.

Jason has S sweets in the bag. Altogether there are C people.
The number of sweets each person has is N.

   a Write a word formula for the number of sweets that each person has.

   b Write a formula using the letters N, S and C.

   c $S = 35$ and $C = 5$. Find the value of N.

*8 Sarah and her friends want to go bowling.

It costs £L to book a lane. It then costs £3 per person. There are C people altogether. The total cost is £T.

a Write a word formula for the total cost for the children to go bowling.

b Write a formula using the letters T, L and C.

**c** If $L = 10$ and $C = 4$, find the value of T.

explanation 3

9 Look at the diagram of the triangle. All the lengths are in centimetres.
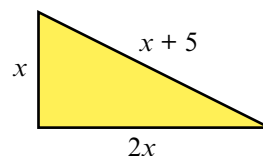
a The perimeter of the triangle is P cm. Explain why $P = 4x + 5$.

b Use the formula $P = 4x + 5$ to find the perimeter when $x = 10$.

10 The perimeter of a shape is P cm. It is found using the formula $P = 6r - 4$.

a Find the perimeter of the shape when $r = 5$.

b Find the perimeter of the shape when $r = 8$.

11 The perimeter of a shape is P cm. It is found using the formula $P = 2(q - 3)$.

a Find the perimeter of the shape when $q = 5$.

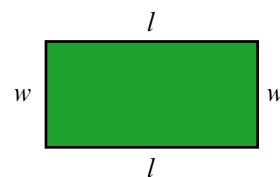**b** Find the perimeter of the shape when $q = 8$.

12 The formula for the perimeter, P cm, of the parallelogram is $P = 4t + 2$.
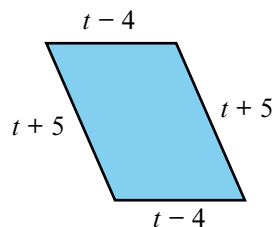
a Use your formula to find the perimeter when $t = 10$.

b Use your formula to find the perimeter when $t = 12$.

13 A rectangle has length l and width w.

The formula for the perimeter of a rectangle
is $P = 2(l + w)$.

a Find the perimeter of a rectangle with
length $l = 15$ cm and width $w = 10$ cm.

b Find the perimeter of a rectangle with
length $l = 17.5$ cm and width $w = 4$ cm.

14 The formula for the area of a rectangle is $A = lw$.

a Find the area of a rectangle with length $l = 15$ cm and width $w = 10$ cm.

b Find the area of a rectangle with length $l = 17.5$ cm and width $w = 4$ cm.

15 The formula $v = \dfrac{d}{t}$ is used to find the average speed of an object.

v is the average speed in metres per second.

d is the distance travelled in metres.

t is the time spent travelling in seconds.

Calculate v for these values of d and t.

a $d = 15$ $t = 3$

b $d = 96$ $t = 12$

c $d = 18$ $t = 20$

16 The cost of calling out an emergency plumber is given
by the formula $P = 60 + 40n$.
P is the cost in pounds.
n is the number of hours it takes to complete the job.

a Explain why $P = 100$ when $n = 1$.

b Calculate P when $n = 3$.

c What is the cost of a job that
takes 8 hours?