

# GCSE Maths: The language of algebra (Foundation): worksheet

GCSE Maths - Algebra Basics - Foundation - Lesson 7.1

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Score: \_\_\_\_\_

15 questions. Write your answers in the spaces. Answers and step-by-step help are free at [websink.site/gcse/maths/ch07-algebra-basics/foundation/the-language-of-algebra/](https://websink.site/gcse/maths/ch07-algebra-basics/foundation/the-language-of-algebra/)

## Exercise 7A Notation and vocabulary Non-calculator

1 Write each in algebraic notation (simplest form).

(a)  $a \times b$

Answer: \_\_\_\_\_

(b)  $3 \times c$

Answer: \_\_\_\_\_

(c)  $d + d + d + d$

Answer: \_\_\_\_\_

(d)  $p \times p$

Answer: \_\_\_\_\_

(e)  $4 \times m \times n$

Answer: \_\_\_\_\_

(f)  $w \div 7$

Answer: \_\_\_\_\_

2 Write each of these out in full, using only  $\times$  signs and no indices.

(a)  $a^3$

Answer: \_\_\_\_\_

(b)  $5b^2$

Answer: \_\_\_\_\_

(c)  $x^2y$

Answer: \_\_\_\_\_

(d)  $3(a + b)$

Answer: \_\_\_\_\_

(e)  $\frac{p}{q}$

Answer: \_\_\_\_\_

3 Write each of these with a fraction as the coefficient, not a decimal.

(a)  $0.5x$

Answer: \_\_\_\_\_

(b)  $0.25y$

Answer: .....

(c)  $1.5a$

Answer: .....

(d)  $0.2m$

Answer: .....

**4** Here is an expression:  $7x^2 + 3x - 9$ .

(a) How many terms does it have?

Answer: .....

(b) What is the coefficient of  $x^2$ ?

Answer: .....

(c) What is the coefficient of  $x$ ?

Answer: .....

(d) What is the constant term?

Answer: .....

(e) Is it an expression, an equation or a formula?

Answer: .....

**5** Write whether each one is an expression, an equation, a formula, an identity or an inequality.

(a)  $5x + 2$

Answer: .....

(b)  $3x + 2 = 11$

Answer: .....

(c)  $P = 2l + 2w$

Answer: .....

(d)  $2(x + 3) \equiv 2x + 6$

Answer: .....

(e)  $x > 4$

Answer: .....

(f)  $7a - 3b$

Answer: .....

**6** Write an algebraic expression for each of these.

(a) 7 more than  $x$

Answer: .....

(b) 5 less than  $y$

Answer: .....

(c) 4 times  $n$

Answer: .....

(d)  $m$  divided by 3

Answer: .....

(e) double  $p$ , then add 1

Answer: .....

(f) 3 less than the product of  $a$  and  $b$

Answer: .....

**7** What does  $3y$  mean? Write  $3y$  as (a) an addition (b) a multiplication. Then do the same for  $5a$ .

Answer: .....

**8** A pencil costs  $p$  pence. Write an expression, in pence, for the cost of (a) 6 pencils (b) 6 pencils and a ruler that costs 40 pence (c) the change from 500 pence after buying the 6 pencils.

(a) 6 pencils

Answer: .....

(b) 6 pencils and a ruler that costs 40 pence

Answer: .....

(c) the change from 500 pence after buying the 6 pencils

Answer: .....

**9** A taxi charges £3 plus £2 for every mile. (a) Write a formula for the cost  $C$  pounds of a journey of  $m$  miles. (b) Use your formula to find the cost of a 5 mile journey.

(a) Write a formula for  $C$ .

Answer: .....

(b) Find the cost of a 5 mile journey.

Answer: .....

**10** The rectangle has length  $l$  and width  $w$ . Write a formula for (a) its perimeter  $P$  (b) its area  $A$ .



(a) the perimeter  $P$

Answer: .....

(b) the area  $A$

Answer: .....

**11** Amy is  $a$  years old. Ben is 5 years older than Amy. Cara is twice as old as Ben. Write an expression for (a) Ben's age (b) Cara's age.

(a) Ben's age

Answer: .....

(b) Cara's age

Answer: .....

- 12** Zoe says that  $4a$  means the same as  $4 + a$ . Use  $a = 3$  to show that she is wrong, and explain what  $4a$  really means.

Answer: .....

- 13** Decide whether each statement is true or false for **all** values of the letters. Give a reason using numbers.

**(a)**  $a + a = 2a$

Answer: .....

**(b)**  $a \times a = 2a$

Answer: .....

**(c)**  $3a = a^3$

Answer: .....

**(d)**  $a \div b = b \div a$

Answer: .....

- 14** Is  $3x + 1 = 13$  an identity? Show that  $x = 4$  is a solution, show that  $x = 5$  is not, and use this to explain your answer.

Answer: .....

- 15** Write down the expression for the perimeter of a rectangle with length  $l$  and width  $w$ , written as  $2(l + w)$ . Explain why this is the same as  $2l + 2w$  by using  $l = 7$  and  $w = 4$ .

Answer: .....