

# Forming Solving Equations

KS3 Maths · Follows the national curriculum

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

## 1. Worked example

**A number doubled then increased by 5 equals 17. Find the number.**

Step 1 · Let the number be  $x$ . Write the equation

$$2x + 5 = 17$$

Step 2 · Subtract 5 from both sides

$$2x = 12$$

Step 3 · Divide both sides by 2

$$x = 6$$

**Answer:  $x = 6$**

Check:  $2(6) + 5 = 12 + 5 = 17$  ✓

## 2. Now try one with the steps

**A rectangle's length is 3 cm more than its width. The perimeter is 26 cm. Find the width.**

Step 1 · Let width =  $w$ . Length =  $w + 3$ . Perimeter formula

Step 2 · Expand and simplify

Step 3 · Subtract 6, then divide by 4

**Answer:**

## 3. Practice

Show your working. The marks tell you how much is expected.

**1.** Five times a number minus 3 equals 22. Find the number. [2]

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**2.** Femi is 4 years older than Aisha. Their ages sum to 30. Find Femi's age. [2]

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3. A triangle has angles  $x$ ,  $2x$ , and  $3x$ . Find  $x$  (angles sum to  $180^\circ$ ). [3]
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4. Two consecutive even numbers sum to 46. Find the smaller number. [3]
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5. The perimeter of a square is  $4(2x + 1)$ . If the perimeter is 36, find  $x$ . [3]
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6. Bob earns  $\pounds x$  per hour. He works 6 hours on Monday and 4 on Tuesday, earning  $\pounds 80$  total. Find his hourly rate. [4]
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7. I think of a number and add 7. The answer is 19. What was my number? [1]
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8. A number is multiplied by 4, then 9 is subtracted. The result is 31. Find the number. [2]
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9. Two angles on a straight line are  $x$  and  $3x$ . Find  $x$ . [2]
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10. Maya has  $n$  sweets. Sam has three times Together they have 48 sweets. How many does Maya have? [2]
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11. An isosceles triangle has angles  $x$ ,  $x$  and  $40^\circ$ . Find  $x$ . [2]

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12. A taxi charges £3 plus £2 for every mile. A journey cost £19. How many miles was it? [3]

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13. Three consecutive odd numbers add up to 75. Find the largest of them. [3]

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14. A rectangle is  $(2x + 1)$  cm long and  $x$  cm wide. Its perimeter is 32 cm. Find its area. [4]

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15. A quadrilateral has angles  $x$ ,  $2x$ ,  $3x - 10$  and  $70^\circ$ . Find  $x$ . [3]

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16. Jack is three times daughter. In 12 years' time he will be twice How old is his daughter now? [4]

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#### 4. Before you hand it in

##### Writing ' $2 + x = 5$ ' for 'a number multiplied by 2 equals 5'

Look for key words: 'times', 'product', 'twice', 'doubled' → multiply. 'More than', 'increased by' → add.

##### Forgetting to check the answer in the original problem context

After solving for  $x$ , re-read the question: it might ask for something derived from  $x$  (e.g.  $x + 3$ , or  $2x$ ).

##### Not expanding brackets properly before solving

Always fully expand brackets first:  $2(x + 3) = 2x + 6$ , not  $2x + 3$ .