

# Express Missing Number Problems Algebraically

For each question, express the problems algebraically and then solve the problem.

Example:

Twelve more than three times a number is 36. What is the number?

$$3n+12=36$$

$$12+3n=36$$

Note: With addition, answers can be either way round:  $n+16=35$ ,  $16+n=35$ ; but not subtraction.

1. Ten less than two times a number is 24. What is the number?

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\_\_\_\_\_

2. 15 is added to three times a number. What is the number?

\_\_\_\_\_

\_\_\_\_\_

3. Fifteen is subtracted from four times a number to make 29. What is the number?

\_\_\_\_\_

\_\_\_\_\_

4. Nineteen more than two times a number is 43. What is the number?

\_\_\_\_\_

\_\_\_\_\_

5. Five times a number has thirteen added to it to make 58. What is the number?

\_\_\_\_\_

\_\_\_\_\_

6. What number is multiplied by 4 and has 23 added to it to make 55?

\_\_\_\_\_

\_\_\_\_\_

7. What number has nineteen subtracted from it to make twenty-five?

\_\_\_\_\_

\_\_\_\_\_

8. 56 is the total of twenty three and three times a number. What is the number?

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\_\_\_\_\_

## Challenge

Write some of your own questions for others to work out.

# Express Missing Number Problems Algebraically

1. A tile shop sells tiles online. Tiles that cover a square metre cost  $\text{£}m$ . Delivery is charged at  $\text{£}d$ .

The area to be covered is  $a$ .

Using the variables  $m$ ,  $d$  and  $a$ , express the cost of tiles to cover area  $a$ .

8 square metres of wall needs to be covered. The cost of the tiles is  $\text{£}9$  per square metre.

Delivery is  $\text{£}5$ . Calculate the cost of the tiles. \_\_\_\_\_

A tiler decides to compare the cost of tiles from different suppliers.

He uses the following table to calculate the different costs.

Supplier	$m$	$a$	$d$	cost
1	$\text{£}6.00$	12	$\text{£}9.00$	
2	$\text{£}7.00$	12	$\text{£}5.00$	
3	$\text{£}8.00$	12	$\text{£}6.00$	
4	$\text{£}6.50$	12	$\text{£}2.00$	
5	$\text{£}7.50$	12	$\text{£}3.00$	

Which supplier is the cheapest? \_\_\_\_\_

If the tiler wants tiles to cover  $15\text{m}^2$ , does the cheapest supplier remain the same? \_\_\_\_\_

2. A man wants to choose a plumber. He asks the plumbers what their hourly rate is, what their call out charge is and whether they offer a discount for early payment.

Using letters to represent the four variables, express the cost of the plumber algebraically.

Create a table with the costs of 5 different plumbers. You will need to write your own costs.



## Challenge

Use a spreadsheet and write a formula to calculate the costs.

Write your own scenario for others to express algebraically.

# Express Missing Number Problems Algebraically Answers

For each question, express the problems algebraically and then solve the problem.

Example:

Twelve more than three times a number is 36. What is the number?

$$3n+12=36$$

$$12+3n=36$$

Note: With addition, answers can be either way round:  $n+16=35$ ,  $16+n=35$ ; but not subtraction.

1. Ten less than two times a number is 24. What is the number?

$$\underline{2n-10=24}$$

$$n= \underline{17}$$

2. 15 is added to three times a number. What is the number?

$$\underline{3n+15=45}$$

$$n= \underline{10}$$

3. Fifteen is subtracted from four times a number to make 29. What is the number?

$$\underline{4n-15=29}$$

$$n= \underline{11}$$

4. Nineteen more than two times a number is 43. What is the number?

$$\underline{2n+19=43}$$

$$n= \underline{12}$$

5. Five times a number has thirteen added to it to make 58. What is the number?

$$\underline{5n+13=58}$$

$$n= \underline{9}$$

6. What number is multiplied by 4 and has 23 added to it to make 55?

$$\underline{4n+23=55}$$

$$n= \underline{8}$$

7. What number has nineteen subtracted from it to make twenty-five?

$$\underline{n-19=25}$$

$$n= \underline{44}$$

8. 56 is the total of twenty three and three times a number. What is the number?

$$\underline{23+3n=56}$$

$$n= \underline{11}$$

## Challenge

Write some of your own questions for others to work out.

# Express Missing Number Problems Algebraically Answers

1. A tile shop sells tiles online. Tiles that cover a square metre cost £m. Delivery is charged at £d.

The area to be covered is a.

Using the variables m, d and a, express the cost of tiles to cover area a.

8 square metres of wall needs to be covered. The cost of the tiles is £9 per square metre.

Delivery is £5. Calculate the cost of the tiles. £77

A tiler decides to compare the cost of tiles from different suppliers.

He uses the following table to calculate the different costs.

Supplier	m	a	d	cost
1	£6.00	12	£9.00	£81.00
2	£7.00	12	£5.00	£89.00
3	£8.00	12	£6.00	£102.00
4	£6.50	12	£2.00	£80.00
5	£7.50	12	£3.00	£93.00

Which supplier is the cheapest? Supplier 4

If the tiler wants tiles to cover 15m<sup>2</sup>, does the cheapest supplier remain the same?

no, supplier 1

2. A man wants to choose a plumber. He asks the plumbers what their hourly rate is, what their call out charge is and whether they offer a discount for early payment.

Using letters to represent the four variables, express the cost of the plumber algebraically.

cost=rh+c-d (where r=hourly rate, h-number of hours, c=call out charge, d=discount)

Create a table with the costs of 5 different plumbers. You will need to write your own costs.



## Challenge

Use a spreadsheet and write a formula to calculate the costs.

Write your own scenario for others to express algebraically.