

GCSE Maths: Equations and the balance idea (Foundation): answers

GCSE Maths - Linear Equations - Foundation - Lesson 9.1

Answers. Final answers to the worksheet questions. Full step-by-step solutions for every question are free at websink.site/gcse/maths/ch09-linear-equations/foundation/equations-and-the-balance-idea/

Exercise 9A Equations and one-step equations

Non-calculator

1 Write down whether each of these is an **expression** or an **equation**.

(a) $4x + 1$

Answer: Expression

(b) $4x + 1 = 13$

Answer: Equation

(c) $7 - x$

Answer: Expression

(d) $\frac{x}{5} = 2$

Answer: Equation

2 Solve these equations. Each one needs you to **subtract**.

(a) $x + 3 = 10$

Answer: $x = 7$

(b) $x + 8 = 15$

Answer: $x = 7$

(c) $x + 6 = 9$

Answer: $x = 3$

(d) $x + 15 = 40$

Answer: $x = 25$

(e) $7 + x = 12$

Answer: $x = 5$

(f) $x + 25 = 61$

Answer: $x = 36$

3 Solve these equations. Each one needs you to **add**.

(a) $x - 2 = 7$

Answer: $x = 9$

(b) $x - 5 = 9$

Answer: $x = 14$

(c) $x - 10 = 4$

Answer: $x = 14$

(d) $x - 1 = 20$

Answer: $x = 21$

(e) $x - 8 = 8$

Answer: $x = 16$

(f) $x - 3 = 0$

Answer: $x = 3$

4 Solve these equations. Each one needs you to **divide**.

(a) $2x = 14$

Answer: $x = 7$

(b) $5x = 20$

Answer: $x = 4$

(c) $3x = 27$

Answer: $x = 9$

(d) $10x = 90$

Answer: $x = 9$

(e) $4x = 36$

Answer: $x = 9$

(f) $7x = 56$

Answer: $x = 8$

5 Solve these equations. Each one needs you to **multiply**.

(a) $\frac{x}{2} = 5$

Answer: $x = 10$

(b) $\frac{x}{3} = 4$

Answer: $x = 12$

(c) $\frac{x}{5} = 6$

Answer: $x = 30$

(d) $\frac{x}{10} = 3$

Answer: $x = 30$

(e) $\frac{x}{4} = 8$

Answer: $x = 32$

(f) $\frac{x}{7} = 7$

Answer: $x = 49$

6 Write down the operation you do to **both sides** first to get x on its own. You do not need to finish solving.

(a) $x + 9 = 14$

Answer: Subtract 9

(b) $x - 6 = 10$

Answer: Add 6

(c) $4x = 20$

Answer: Divide by 4

(d) $\frac{x}{5} = 3$

Answer: Multiply by 5

7 Solve these equations, using what you know about inverse operations.

(a) $x + 47 = 91$

Answer: $x = 44$

(b) $8x = 96$

Answer: $x = 12$

(c) $x - 29 = 31$

Answer: $x = 60$

(d) $\frac{x}{6} = 12$

Answer: $x = 72$

(e) $x + 148 = 372$

Answer: $x = 224$

(f) $12x = 180$

Answer: $x = 15$

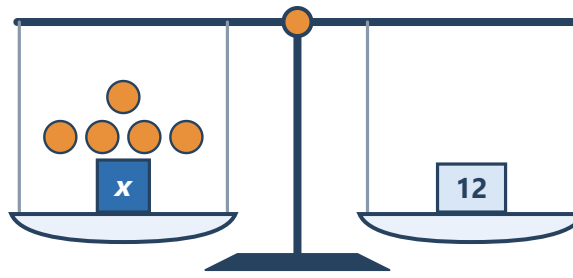
8 Ravi thinks of a number. He adds 9 and gets 25. What number did Ravi think of?

Answer: 16

9 A box of 8 identical chocolates costs £6. Work out the cost of one chocolate. Give your answer in pence.

Answer: 75p

10 The scales balance. The box has a mass of x kg. Write down an equation and use it to find the mass of the box.



$$\text{box} + 5 \text{ kg} = 12 \text{ kg}$$

Answer: 7 kg

- 11** Sam says “ $x = 4$ ” is the solution of each equation. Substitute 4 for x to decide whether he is right. Write **yes** or **no**.

(a) $x + 5 = 9$

Answer: Yes

(b) $3x = 15$

Answer: No

(c) $x - 2 = 3$

Answer: No

(d) $\frac{x}{2} = 2$

Answer: Yes

- 12** Sam solves $x + 6 = 15$ and writes $x = 21$. Explain his mistake and work out the correct solution.

Answer: He added 6 instead of subtracting. $x = 9$

- 13** Write an equation for each sentence, then solve it to find the number.

(a) A number plus 7 is 19

Answer: The number is 12

(b) A number minus 6 is 11

Answer: The number is 17

(c) 5 times a number is 40

Answer: The number is 8

(d) A number divided by 4 is 9

Answer: The number is 36

- 14** The equations $x + a = 12$ and $3x = 18$ have the same solution. Work out the value of a .

Answer: $a = 6$

- 15** Complete the solutions. Use the balance idea to find x .

(a) $x + 1 = 4$

Answer: $x = 3$

(b) $x + 2 = 5$

Answer: $x = 3$

(c) $2x = 6$

Answer: $x = 3$

(d) $x - 1 = 3$

Answer: $x = 4$

16 There are 5 identical bags of sweets. In total there are 40 sweets. How many sweets are in one bag?

Answer: 8