

## Unknown Numbers in Equations

When an equation has a question mark or a box, ask: “What operation makes the equation true?” Then *undo* that operation on the other side to find the unknown.

If the equation is ...	Undo with ...
$? + a = b$	subtraction: $? = b - a$
$? - a = b$	addition: $? = b + a$
$? \times a = b$	division: $? = b \div a$
$? \div a = b$	multiplication: $? = b \times a$

### Key Concepts

1. An equation with an unknown asks: “What number makes this true?”
2. To find the unknown, do the *opposite* of what’s happening to it. Addition undoes subtraction. Multiplication undoes division.
3. Always **check** by plugging your answer back into the original equation.
4. The unknown can be on the left or the right of the equals sign — the strategy is the same.

### Worked Examples

① Solve:  $? + 14 = 30$ .

 The unknown plus 14 equals 30. Undo the “+14” by subtracting 14 from 30:  $? = 30 - 14 = 16$ . Check:  $16 + 14 = 30$  ✓.

 **Answer: 16**

② Solve:  $? - 9 = 27$ .

 The unknown minus 9 equals 27. Undo the “-9” by adding 9 to 27:  $? = 27 + 9 = 36$ . Check:  $36 - 9 = 27$  ✓.

 **Answer: 36**

③ Solve:  $? \times 6 = 42$ .

 The unknown times 6 equals 42. Undo the “×6” by dividing 42 by 6:  $? = 42 \div 6 = 7$ . Check:  $7 \times 6 = 42$  ✓.

 **Answer: 7**

### Practice Problems

Find the unknown number.

1.  $? + 8 = 25$  \_\_\_\_\_

3.  $? \times 5 = 35$  \_\_\_\_\_

2.  $? - 15 = 34$  \_\_\_\_\_

4.  $? \div 4 = 9$  \_\_\_\_\_

5.  $17 + ? = 50$  \_\_\_\_\_

6.  $? - 22 = 48$  \_\_\_\_\_

7.  $? \times 8 = 56$  \_\_\_\_\_

8.  $? \div 7 = 6$  \_\_\_\_\_

9.  $? + 36 = 81$  \_\_\_\_\_

10.  $? - 19 = 41$  \_\_\_\_\_

11.  $? \times 9 = 63$  \_\_\_\_\_

12.  $? \div 3 = 8$  \_\_\_\_\_

**Study Tips**

- 👉 Each operation has an opposite. Memorize the pairs:  $+$  undoes  $-$ ;  $\times$  undoes  $\div$ .
- 👉 Always plug your answer back into the original equation. If it works, you're done.
- 👉 For " $? \div a = b$ " the trick is to *multiply* both sides by  $a$ . The unknown turns out to be  $a \times b$ .

**Word Problems**

1. Jake had some baseball cards. He gave away 12 and now has 35. How many did he start with? Write an equation.

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

2. A baker puts muffins into bags of 6. She fills ? bags and uses 54 muffins in all. How many bags?

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

**Answer Key — with Friendly Explanations****Practice Problems**

1. Undo addition:  $25 - 8 = 17$ .

 **Answer:** 17

2. Undo subtraction:  $34 + 15 = 49$ .

 **Answer:** 49

3. Undo multiplication:  $35 \div 5 = 7$ .

 **Answer:** 7

4. Undo division:  $9 \times 4 = 36$ .

 **Answer:** 36

5. Undo addition:  $50 - 17 = 33$ .

 **Answer:** 33

6. Undo subtraction:  $48 + 22 = 70$ .

 **Answer:** 70

7. Undo multiplication:  $56 \div 8 = 7$ .

 **Answer:** 7

8. Undo division:  $6 \times 7 = 42$ .

 **Answer:** 42

9. Undo addition:  $81 - 36 = 45$ .

 **Answer:** 45

10. Undo subtraction:  $41 + 19 = 60$ .

 **Answer:** 60

11. Undo multiplication:  $63 \div 9 = 7$ .

 **Answer:** 7

12. Undo division:  $8 \times 3 = 24$ .

 **Answer:** 24**Word Problems**

1.  $? - 12 = 35 \Rightarrow ? = 47$ .

 **Answer:** 47 cards

2.  $? \times 6 = 54 \Rightarrow ? = 9$ .

 **Answer:** 9 bags

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