

TARGET To solve missing number problems and begin to express such problems algebraically.

Performing the same calculation on both sides of an equation will mean that the sides remain equal. This allows us to find the missing number in an equation.

Examples

$$\square + 7 = 19$$

$$\square = 12$$

(-7 from both sides)

$$\square \div 6 = 3$$

$$\square = 18$$

(both sides $\times 6$)

$$4 \times \square - 5 = 23$$

$$4 \times \square = 28 \text{ (+5 both sides)}$$

$$\square = 7 \text{ (\div 4 both sides)}$$

In algebra we use letters instead of boxes for missing numbers.

In the following examples form an algebraic equation using x and solve the equation to find the value of x .

- 1 Divide x by 2 and take 5 to give 17.

$$\frac{x}{2} - 5 = 17 \text{ (\frac{x}{2} means } x \div 2)$$

$$\frac{x}{2} = 22 \text{ (+5 both sides)}$$

$$x = 44 \text{ (\times 2 both sides)}$$

- 2 Multiply x by 3 and add 2 to give 20.

$$3x + 2 = 20 \text{ (3x means 3 times } x)$$

$$3x = 18 \text{ (-2 both sides)}$$

$$x = 6 \text{ (\div 3 both sides)}$$

A

Find the missing number.

1 $\square + 4 = 11$

2 $15 + \square = 24$

3 $\square + 0.7 = 1.3$

4 $\square + \frac{2}{3} = 1\frac{1}{3}$

5 $0.48 + \square = 1$

6 $\square - 30 = 26$

7 $\square - 19 = 88$

8 $\square - \frac{4}{5} = 2\frac{1}{5}$

9 $\square - 0.37 = 1\frac{1}{4}$

10 $\square - 0.66 = 9.5$

11 $45 \times \square = 90$

12 $3 \times \square = 24$

13 $0.5 \times \square = 2$

14 $10 \times \square = 1.7$

15 $80 \times \square = 560$

16 $\square \div 3 = 12$

17 $\square \div 5 = 0.8$

18 $\square \div 9 = 30$

19 $\square \div 10 = 0.43$

20 $\square \div 6 = \frac{1}{4}$

Find the number.

- 21 Double this number and add 3 to give an answer of 11.

- 22 Multiply this number by 4 and subtract 7 to give 5.

- 23 Multiply this number by 5 and subtract 3 to give 7.

- 24 Multiply this number by 6 and add 2 to give 20.

- 25 Multiply this number by 3 and subtract 6 to give 9.

- 26 Double this number and subtract 4 to give 12.

B

Find the missing number by forming an algebraic equation and solving it.

- | | |
|---|---------------------------------------|
| 1 $3 \times \square + 5 = 11$ | 11 $\square \div 2 + 11 = 26$ |
| 2 $9 + 6 \times \square = 51$ | 12 $\square \div 10 - 1.4 = 2.4$ |
| 3 $10 \times \square - 1.4 = 3.6$ | 13 $\square \div 6 + 8 = 17$ |
| 4 $4 \times \square + \frac{3}{5} = 2\frac{1}{5}$ | 14 $\square \div 7 - 29 = 6$ |
| 5 $7 \times \square + 0.8 = 6.4$ | 15 $\square \div 4 + 0.25 = 1$ |
| 6 $8 = 3 \times \square - 7$ | 16 $2 = \square \div 3 - \frac{2}{3}$ |
| 7 $50 = 6 \times \square + 2$ | 17 $8 = \square \div 9 + 4$ |
| 8 $32 = 10 + 2 \times \square$ | 18 $20 = \square \div 12 + 9$ |
| 9 $2\frac{1}{2} = \frac{3}{4} + 7 \times \square$ | 19 $0.6 = \square \div 5 - 0.3$ |
| 10 $2 = 5 \times \square - 0.5$ | 20 $0 = \square \div 8 - 12$ |

Form an equation and find the value of x .

- 21 Multiply x by 5 and add 4 to give 19.
- 22 Double x and subtract 6 to give 8.
- 23 Multiply x by 7 and subtract 15 to give 13.
- 24 Divide x by 3 and subtract 7 to give 5.
- 25 Multiply x by 9 and subtract 11 to give 7.
- 26 Divide x by 4 and add 10 to give 16.
- 27 Multiply x by 4 and add 4 to give 100.

C

Solve the equation.

- 1 $4x + 2 = 30$
- 2 $3p - 0.6 = 3.9$
- 3 $8t + 2.8 = 10$
- 4 $7k + 3 = 45$
- 5 $12d - 8 = 100$
- 6 $\frac{m}{4} + 7 = 32$
- 7 $\frac{c}{6} - 2 = 9$
- 8 $\frac{z}{10} + 1.7 = 3.3$
- 9 $\frac{u}{5} - 5 = 7$
- 10 $\frac{n}{3} + 0.4 = 1$

Find the value of x .

- 11 $2x + 4 = 4x - 2$
- 12 $3x - 7 = x + 3$
- 13 $6x + 10 = 10x + 4$
- 14 $7x - 2 = 2x + 28$
- 15 $x + 3 = 4x - 3$
- 16 $3x + 1 = 2x + 3$
- 17 $x + 3 = 2x - 1$
- 18 $5x - 1 = 4x + 2$
- 19 $3x + 3 = 4x - 4$
- 20 $x + 6 = 3x - 14$

Form an equation and find the value of x .

- 21 Adding 3 to x gives the same answer as doubling it and subtracting 5.
- 22 Multiplying x by 3 and taking 2 gives the same answer as adding 6 to x .
- 23 Doubling x and adding 5 gives the same answer as multiplying x by 5 and subtracting 4.
- 24 Multiplying x by 10 and subtracting 6 gives the same answer as doubling x and adding 6.
- 25 Multiplying x by 5 and taking 1 gives the same answer as trebling x and adding 3.