

Linear equations

Starter

- (Review of last lesson)** Daniel puts one-and-a-half times as much money into a business as his partner Elsie. They share the profits in that same ratio. How much of a £5700 profit does Daniel get?
- (Review of last lesson)** Mr Lee left his fortune to his 3 sons, 4 nieces and his wife. Each son received twice as much as each niece and his wife received £6000, which was a quarter of the money. How much did each son receive?
- (Review of previous material)**
Solve these equations: (a) $2x - 5 = 17$ (b) $47 - 9x = 11$

Notes

Linear equations are rearranged in the order SADMIB:

Subtraction

Addition

Division

Multiplication

Indices (i.e. powers)

Brackets

To transfer a number from one side to the other, do the **opposite operation**. For example, if a number is multiplying on one side, it will divide on the other side.

When giving your final answer, make sure the unknown is on the **LHS** and **positive**.

N.B. Always have the '=' sign in a column, one above the other.
If the unknown has a negative coefficient, it can be a good idea to take it to the other side.
If there are unknowns on both sides, collect them together so that the coefficient of the unknown is positive.

Always make sure your final answer has the unknown on the left-hand side i.e. $x = \dots$

E.g. 1 Solve: (a) $a - 3 = 3a - 7$ (b) $2y - 1 = 4 - 3y$

Working: (a) $a - 3 = 3a - 7$
Subtract a from both sides: $-3 = 2a - 7$
Add 7 to both sides: $4 = 2a$
Divide both sides by 2: $2 = a$
Make sure the unknown is on the LHS: $a = 2$

If the unknown is in the denominator, it must at some point be rearranged so that it appears in the numerator.

E.g. 2 Solve: (a) $\frac{6}{x} = \frac{5}{4}$ (b) $14 - \frac{x}{5} = 16$ (c) $\frac{x}{4} - 7 = 12$

Working: (a) *Cross-multiply to get x in the denominator:*

$$\begin{array}{l} \frac{6}{x} = \frac{5}{4} \\ 6 \times 4 = 5 \times x \\ 24 = 5x \\ \frac{24}{5} = x \\ 4.8 = x \\ x = 4.8 \end{array}$$

Divide both sides by 5:

Make sure the unknown is on the LHS:

Video: [Solving linear equations](#)

[Solutions to Starter and E.g.s](#)

Exercise

9-1 class textbook: p158 M6.1 Qu 17-44 odd
A*-G class textbook: p148 M6.1 Qu 17-47 odd
9-1 homework book: p55 M6.1 Qu 1-37 odd
A*-G homework book: p40 M6.1 Qu 1-37 odd

Summary

Linear equations are rearranged in the order **SADMIB**:

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To transfer a number from one side to the other, do the *opposite operation*. For example, if a number is multiplying on one side, it will divide on the other side.