

Mathematics

Algebra - Solving Equations - Part 2

Practice Questions

- a) $2x + 5 = 3x - 1$ $x = \underline{\hspace{2cm}}$
 b) $4x - 2 = 2x + 10$ $x = \underline{\hspace{2cm}}$
 c) $2x + 5 = x + 10$ $x = \underline{\hspace{2cm}}$
 d) $5x - 9 = 3x + 15$ $x = \underline{\hspace{2cm}}$
 e) $9x - 5 = 7x + 11$ $x = \underline{\hspace{2cm}}$
 f) $12x + 8 = 10x + 16$ $x = \underline{\hspace{2cm}}$
 g) $3x + 6 = 5x - 2$ $x = \underline{\hspace{2cm}}$
 h) $4x - 3 = 2x + 9$ $x = \underline{\hspace{2cm}}$
 i) $10x - 6 = 8x + 4$ $x = \underline{\hspace{2cm}}$
 j) $6x - 4 = 5x + 7$ $x = \underline{\hspace{2cm}}$
 k) $7x + 9 = 9x - 5$ $x = \underline{\hspace{2cm}}$

A bag contains two mystery envelopes containing money and some pound coins. Josh and Jacob take an envelope each and some pound coins. Josh has 8 pound coins and Jacob has 9. When they open their mystery envelopes, Josh discovers 5 coins in there and Jacob finds 3. When they add all of their coins together, they have the same amount as each other.

Tick what each coin must be worth in the mystery bag. All of the coins are the same.



EXTENSION

Jacob was given another 3 pound coins. How much are the coins in the mystery bag worth now?

What do I do?

When solving equations, you'll be asked to solve an unknown quantity that has been represented by a letter or symbol.

When working through the question, always be mindful to put the equals sign in the middle and whatever you do to one side of the '=' sign, you must do to the other side.

The following example is based on two unknown values.

Here we have an unknown 'x' value on both sides. We need to eliminate the smaller value from both sides so that our equation will have 'x' on only one side.
-2x from each side.

Example:

$$\begin{array}{r} 2x + 5 = 3x - 1 \\ -2x \quad -2x \\ \hline 5 = x - 1 \\ +1 \quad +1 \\ \hline 6 = x \\ \hline x = 6 \end{array}$$

Almost done, now we need to eliminate the -1 to get x on its own. We use our inverse by +1 to both sides.

Finally, $6=x$ and $x=6$ means the same. Just switch it round to match the answer format.

Top Tips!

You could be asked to:

- Form an equation from a written problem
- Solve an equation by stating what a letter or symbol means
- There might be an unknown value on one side or both sides of the equals sign.

What skills do I need to improve?



Doing lots of practice questions will help with becoming familiar with question types but what else can you do to improve in this area?

- Lots of practice. Working systematically and neatly will help you to work through the question without making mistakes that could be avoided!

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Answers

a) $x = 6$

b) $x = 6$

c) $x = 5$

d) $x = 12$

e) $x = 8$

f) $x = 4$

g) $x = 4$

h) $x = 6$

i) $x = 5$

j) $x = 11$

k) $x = 7$

Josh

Jacob



+ coins =



+ coins

$$5x + 8 = 3x + 9$$

$-3x$

$$2x + 8 = 9$$

$-3x$

-8

$$2x = 1$$

-8

$$x = 0.5$$



EXTENSION

Jacob was given another 3 pound coins. How much are the coins in the mystery bag worth now?

Josh

Jacob



+ coins =



+ coins

$$5x + 8 = 3x + 12$$

$-3x$

$$2x + 8 = 12$$

$-3x$

-8

$$2x = 4$$

-8

$$x = 2$$

Now the mystery coins are worth **£2 each**.

