Solve simultaneous linear equations where you need to multiply one of the equations

Maths

Mrs Dennett

Solve equations where you need to multiply one of the equations

1. Here are two equations.

$f + g = 20$ $2f + 2g = 40$

a) What is the same? What is different?

b) Which of these statements about the two equations do you agree with? Why?

The equations look different so f and g have different values.

The equations are equivalent so f and g always have the same values.

2. In each of the following, make the coefficient of x or y the same

$x + 4y = -1$
$2x - 2y = 8$

$3x + 7y = 37$
$9x + 4y = 43$

$4x - 2y = 19$
$x + 10y = 10$

$6x + 5y = -4$
$4x - 15y = 34$

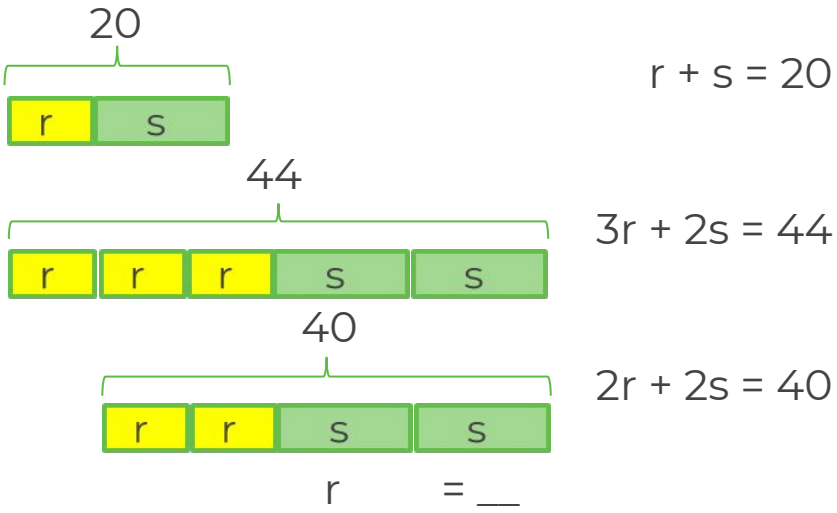
3. Here are a pair of simultaneous equations.

$$f + g = 19$$
$$3f - 2g = 8$$

Is f = 10 and g = 9 a solution to both these equations?
Give a reason for your answer.

Solve equations where you need to multiply one of the equations

4. Use the bar models to help you find the value of r and the value of s.



r = _____ and s = _____ __ + s = 20

5. Solve these pairs of equations.

a) $x + 4y = -1$
$2x - 2y = 8$

b) $3x + 7y = 37$
$9x + 4y = 43$

c) $4x - 2y = 19$
$x + 10y = 10$

d) $6x + 5y = -4$
$4x - 15y = 34$

6. There are 16 animals in a field.
There are chickens (c) and sheep (s).
There are 40 legs in total.
How many sheep are in the field?

Answers

Solve equations where you need to multiply one of the equations

1. Here are two equations.

$f + g = 20$ $2f + 2g = 40$

a) What is the same? What is different?

Same letters (variables).
The second equation is double the first.

b) Which of these statements about the two equations do you agree with? Why?

The equations look different so f and g have different values. ✖

The equations are equivalent so f and g always have the same values.

2. In each of the following, make the coefficient of x or y the same

$x + 4y = -1$ (×2) $4x - 4y = 16$ $9x + 21y = 111$ (×3) $9x + 4y = 43$

$20x - 10y = 95$ (×4) or (×5) $x + 10y = 10$ $18x + 15y = -12$ (×3) $4x - 15y = 34$

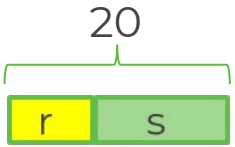
3. Here are a pair of simultaneous equations.

$f + g = 19$
$3f - 2g = 8$

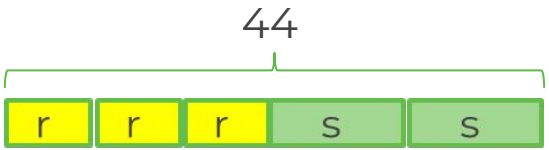
Is f = 10 and g = 9 a solution to both these equations? No 3 x 10 - 2x9 ≠8
Give a reason for your answer.

Solve equations where you need to multiply one of the equations

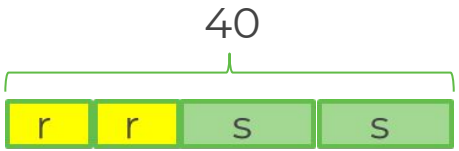
4. Use the bar models to help you find the value of r and the value of s.



r + s = 20



3r + 2s = 44



2r + 2s = 40

r = 4

r = ___ and s = ___ + s = 20

16

4

5. Solve these pairs of equations

a) $x + 4y = -1$
$2x - 2y = 8$
$x = 3, y = -1$

b) $3x + 7y = 37$
$9x + 4y = 43$
$x = 3, y = 4$

c) $4x - 2y = 19$
$x + 10y = 10$
$x = 5, y = 0.5$

d) $6x + 5y = -4$
$4x - 15y = 34$
$x = 1, y = -2$

Solve equations where you need to multiply one of the equations

6. There are 16 animals in a field.

There are chickens(c) and sheep(s).

There are 40 legs in total.

How many sheep are in the field?

$c + s = 16$

$2c + 4s = 40$

$c = 12$ and $s = 4$