SUPER 12s

SUPER 12s CAN BE USED AS AN INDIVIDUALISED MASTERY LEARNING PROGRAM.

2 ALGEBRA
2.12 SIMULTANEOUS EQNS
2.12 LEVEL 3

NAME : _____

Skill description: Solving simultaneous equations by elimination that require the multiplication of one equation.

Essential Revision

1. Solve for the unknown.

$$h - 3 = 22$$

2. Solve these equations by substitution.

$$2x + y = 7$$
$$x = 2y + 6$$

3. Solve these equations by elimination.

$$x + y = 6$$
$$-3x + y = 2$$

4. Solve for the unknown.

$$9t = 90$$

5. Solve these equations by substitution.

$$y = 2x - 3$$
$$5x - 3y = 11$$

6. Solve these equations by elimination.

$$2x + y = 10$$
$$-x + y = -5$$

7. Solve for the unknown.

$$\frac{h}{7} = 4$$

8. Solve these equations by substitution.

$$x + y = -1$$
$$y = x + 5$$

9. Solve these equations by elimination.

$$3x + y = 1$$
$$-4x + y = 15$$

10. Solve for the unknown.

$$z + 5 = 26$$

11. Solve these equations by substitution.

$$3x + 4y = 8$$
$$y = 2x + 13$$

12. Solve these equations by elimination.

$$6x + y = 18$$
$$4x + y = 14$$

Solutions can be found at the end of the booklet.

score $\frac{\quad}{12}$

STRATEGIES TO SOLVE THE PROBLEMS

Remember from the previous levels:

Use elimination if all the **variables are on the same side of the equals sign for both equations.**

Example 1

Solve these simultaneous equations by elimination.

$$3x + 3y = 24$$
$$2x + y = 13$$

Step 1

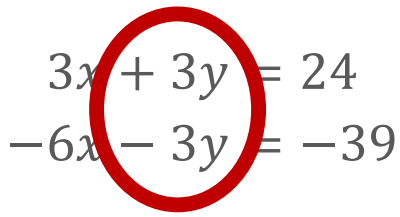
See if the equations have a positive/negative pair. This means the equations have the same variable with a coefficient equal in magnitude but opposite in sign.

We can create a positive/negative pair by multiplying the bottom equation by -3. The y terms will then be a positive/negative pair.

$$3x + 3y = 24$$
$$-3(2x + y = 13)$$

$$3x + 3y = 24$$
$$-6x - 3y = -39$$

We now have a positive/negative pair.



Step 2

Use addition to add each pair of terms.

$$\begin{array}{r} 3x + 3y = 24 \\ -6x - 3y = -39 \\ \hline -3x \qquad = -15 \end{array}$$

Step 3

Solve for the unknown.

$$-3x = -15$$

$$x = \frac{-15}{-3}$$

$$x = 5$$

Step 4

Now that you have the value for one unknown, we need to substitute this back into one of the original equations to find the value of the other unknown.

$$x = 5$$

$$2x + y = 13$$

$$10 + y = 13$$

$$y = 3$$

Final solution

$$x = 5\,, y = 3$$

QUESTIONS

Solve these equations by elimination.

1.

$$x - y = 2$$
$$3x + 2y = 6$$

2.

$$-2x + 3y = 15$$
$$x - y = 2$$

3.

$$2x + y = 11$$
$$x - 3y = 9$$

4.

$$x + 2y = 9$$
$$3x - y = 6$$

5.

$$4x + y = 25$$
$$x - 3y = 16$$

6.

$$5x + 2y = 17$$
$$4x + y = 10$$

7.

$$6x + 5y = 13$$
$$2x + 3y = 3$$

8.

$$3x + 2y = 23$$
$$4x - y = 16$$

9.

$$5x + 8y = 19$$
$$3x + 4y = 9$$

10.

$$5x + 2y = 16$$
$$3x + 4y = 4$$

11.

$$4x + 2y = 34$$
$$3x + y = 21$$

12.

$$15x - 4y = 82$$
$$5x - 9y = 12$$

score $\frac{\quad}{12}$

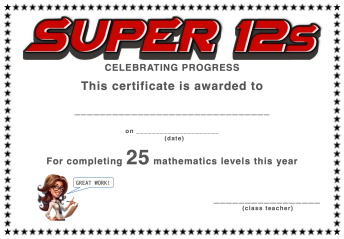
MASTERY TEST

Teacher's signature

I'VE COMPLETED

_____

LEVELS THIS YEAR



Solutions to Essential Revision

1. $h = 25$	2. $x = 4, y = -1$
3. $x = 1, y = 5$	4. $t = 10$
5. $x = -2, y = -7$	6. $x = 5, y = 0$
7. $h = 28$	8. $x = -3, y = 2$
9. $x = -2, y = 7$	10. $z = 21$
11. $x = -4, y = 5$	12. $x = 2, y = 6$

Solutions to Questions

1. $x = 2, y = 0$	2. $x = 21, y = 19$
3. $x = 6, y = -1$	4. $x = 3, y = 3$
5. $x = 7, y = -3$	6. $x = 1, y = 6$
7. $x = 3, y = -1$	8. $x = 5, y = 4$
9. $x = -1, y = 3$	10. $x = 4, y = -2$
11. $x = 4, y = 9$	12. $x = 6, y = 2$