SUPER 12s

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

2 ALGEBRA
2.10 SOLVING EQUATIONS
2.10 LEVEL 2

NAME: _____

Skill description: Introduction of variables & solving equations with the addition/subtractions of integers.

Essential Revision

1. $7 + 10 =$

2. Solve for the unknown.
$\blacksquare + 14 = 18$

3. $7 + 19 =$

4. $6 - 4 =$

5. Solve for the unknown.
$\blacksquare + 13 = 15$

6. $9 + 12 =$

7.

$15 - 3 =$

8. Solve for the unknown.

$\blacksquare + 4 = 22$

9.

$13 - 11 =$

10.

$7 + 5 =$

11. Solve for the unknown.

$\blacksquare + 3 = 10$

12.

$21 - 11 =$

Solutions can be found at the end of the booklet.

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

STRATEGIES TO SOLVE THE PROBLEMS

When solving equations, the goal is to:

Isolate the desired variable (unknown)
to one side of the equal sign.

We will see over the next few levels that we follow the order:

- **First:** isolate the term that contains the desired variable (unknown).
- **Second:** isolate the desired variable (unknown).

A **variable** is a symbol for a value we don't know yet.
It is usually a letter like x or y.

In the last level, we used ■ to represent the unknown. In mathematics, it's more common to use letters.

Strategy 1 – Apply the inverse operation to both sides.

For any constants on the same side of the equal sign as the desired variable, apply the inverse operation (of that constant) to both sides of the equation.

Example 1

Find the value of the variable.

$$x - 7 = 12$$

Take the number (7) on the same side as the variable and apply the inverse operation $(+)$ to both sides of the equation.

$$x - 7 = 12$$

$$+7 = +7$$

$$x = 19$$

Strategy 2 – Change the side, change the sign.

For any constants on the same side of the equal sign as the desired variable, move to the other side and apply the inverse operation.

Example 2

Find the value of the variable.

$$x - 6 = 21$$

Take the -6 and move it to the other side of the equation and change the sign from – to +.

$$x - 6 = 21$$

$$x = 21 + 6$$

$$x = 27$$

Strategy 3 – Guess, check and improve.

Choose a value to substitute for the variable, calculate and compare both sides of the equation. Adjust the input value until both sides are equal.

Example 3

Find the value of the variable.

$$x + 7 = 15$$

Choose 5 as the input value.

$$x + 7 = 15$$

$$\downarrow$$

$$(5) + 7 = 15$$

$$\searrow$$

$$12 = 15$$

The left-hand side equals 12 which is too low! We're trying to achieve the value of 15, so we need to increase our input value.

Choose 10 as the input value.

$$x + 7 = 15$$

$$(10) + 7 = 15$$

$$17 = 15$$

The left-hand side equals 17 which is too high! We're trying to achieve the value of 15, so we need to decrease our input value.

Choose 8 as the input value.

$$x + 7 = 15$$

$$(8) + 7 = 15$$

$$15 = 15$$

Spot on! So, the value of x is 8.

QUESTIONS

Solve for the unknown.

1.

$$x + 11 = 18$$

2.

$$y - 4 = 12$$

3.

$$p + 9 = 19$$

4.

$$m - 4 = 7$$

5.

$$x + 2 = 31$$

6.

$$r + 9 = 17$$

7.

$y - 3 = 9$

8.

$t + 4 = 55$

9.

$h - 3 = 22$

10.

$z + 5 = 26$

11.

$f + 13 = 22$

12.

$g - 11 = 19$

SOLUTIONS CAN BE FOUND AT THE END OF THE BOOKLET.

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

MASTERY TEST

Teacher's signature

I'VE COMPLETED

_____

LEVELS THIS YEAR

Solutions to Essential Revision

1. 17	2. ■ = 4
3. 26	4. 2
5. ■ = 2	6. 21
7. 12	8. ■ = 18
9. 2	10. 12
11. ■ = 7	12. 10

Solutions to Questions

1. $x = 7$	2. $y = 16$
3. $p = 10$	4. $m = 11$
5. $x = 29$	6. $r = 8$
7. $y = 12$	8. $t = 51$
9. $h = 25$	10. $z = 21$
11. $f = 9$	12. $g = 30$