**Learning Goals:**

**Solving Simple Equations**

* **I can understand what it means to solve an equation.**
* **I can solve equations by applying opposite operations to isolate a variable.**

**Definitions:**

Equation:

What does it mean to “solve an equation”?

Did you Know:

The value of the variable that makes the statement true is called or .

*Here is a simple example:* **** *This means “What number subtracted by 5 gives a result of 8?”*

This equation is said to be because the degree of $n$ is in the .

The equation will become **true** only when the unknown value is found, which is the .

By inspection the solution to :  is because

Mathematically we write:

Typically we always leave the variable on the “left”. Why?

**But we can still write the variable on the right and this doesn’t change the statement such as:**

**The LAW OF OPPOSITE OPERATION**

There are two pairs of inverse operation: and

 and

Formally, we solve an equation by .

This means the variable .

Ex ➋ Solve $x+7=-9$

By inspection: By using opposite operation

The *process* of solving an equation is called

**Examples:** Let’s demonstrate this process.

1. Solve for the unknown variable in each case.

 **Equation Explanation (Steps)**

|  |  |  |
| --- | --- | --- |
| **1.** |  |  |
| **2.** |  |  |
| **3.**  |  |  |

1. Find the root of each equation.
2. $6x=24$ **(iii)** $1-y=-7$ (iii) $-t-3=8$

**(iv)** $\frac{1}{2}x=7$ **(iv)** $\frac{4d}{5}=-2$ (v) $-3x=-27$

**Modeling with Equations: Write an equation and define the variable for each of the following.**

![MCj03569190000[1]]()

1. An appliance company charges $50 for a service call and $65/h for labour.

If the total cost for a service call was $212.50, how long was the service call?

1. Liz was testing Natalie on solving equations. She gave Natalie the following problem:

“I am a number such that when you divide me by 7, and then, add 13 you get 32. What number am I?”

Determine Liz’s number.

![C:\Users\ebars_000\AppData\Local\Microsoft\Windows\INetCache\IE\Q7WN0K97\MP900442358[1].jpg]()

1. A hot-air balloon is at a height of 500 m. It develops a steady leak and begins to descend at a rate of 60 m/min. Determine how long it takes for the balloon to reach a height of 20 m.