Scientific Notations

Scientific notation or standard form is a compact way of writing very big or very small numbers. As the name suggests, scientific notation is frequently used in science. For example:

- The sun has a mass of approximately 1.988×10^{30} kg which is much easier to write than $1\,988\,000\,000\,000\,000\,000\,000\,000\,000\,000$ kg

- The mass of at atom of Uranium (one of the heaviest elements) is only approximately 3.95×10^{-22} g. That is $0.000\,000\,000\,000\,000\,000\,000\,395$ g.

Remember

$$23.2 \times 10^4 \qquad 200 \times 10^4$$
$$0.23 \times 10^4 \qquad 1.2 \quad 1 \; , \; 2$$

In scientific notation, numbers are written in the form $a \times 10^b$, where a is a number **between** 1 and 10 and b is an integer (positive or negative).

- A negative index indicates how many factors of ten **smaller** than a the value is.
- A positive index indicates how many factors of ten **larger** than a the value is.
- A index of zero indicates that the value is a because $10^0 = 1$.

$63300. \longrightarrow$ Scientific notation.

6.33×10^4 } If decimal point moves to the left, the power is +ve, if it moves to the right then the power is negative.

00000405

4.05×10^{-3}

$2.49 \times 10^5 \longrightarrow 249000$

$7.14 \times 10^{-5} \longrightarrow 0.0000714$
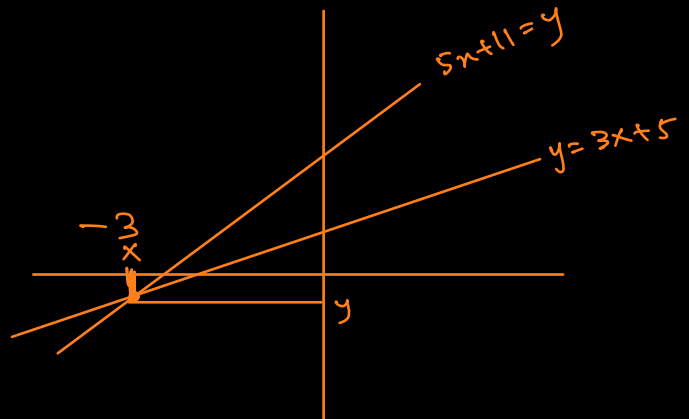
Systems of Equations

$$y = 5x + 11$$
$$y = 3x + 5$$

$$3x + 5 = 5x + 11$$

$$5 - 11 = 5x - 3x$$

$$2x = -6$$

$$\boxed{x = -3}$$

$$y = 5(-3) + 11$$
$$= -15 + 11$$
$$y = -4$$

Graph: $5x + 11 = y$, $y = 3x + 5$, $-3 \quad x$, y

$$\boxed{\begin{array}{l} x = -3 \\ y = -4 \end{array}}$$

$$5x + 2y = 22 \quad \text{①}$$

$$2x + 5y = -8 \quad \text{②}$$

$$5x = 22 - 2y$$

$$x = \frac{22 - 2y}{5} \quad \text{③}$$

Substitute ③ onto ②

$$2\left(\frac{22 - 2y}{5}\right) + 5y = -8$$

$$\frac{44 - 4y}{5} + \frac{5y}{1} = -8$$

$$-40 = 44 + 21y$$

$$21y = -84$$

$$y = -\frac{84}{21} \qquad \begin{cases} x = \frac{22 - 2(-4)}{5} \end{cases}$$

$$y = -4 \qquad x = \frac{22 + 8}{5} = \frac{30}{5} = 6$$

$$\frac{44 - 4y + 25y}{5} = \frac{-8}{1}$$

$$5(-8) = 44 - 4y + 25y$$

$$y = -4, \quad x = 6$$

Sol^n

In the rest of May

21 → **3 days**

Tue, Sun

6:30-8 | 6-7:30