

ALGEBRAIC STATEMENTS

A barrel weighs 15 kilograms more than a bale of hay.

A bale of hay and a barrel together weigh 135 kilograms.

If we swap the barrel for a bale of hay and a 15-kilogram weight, then the two bales of hay plus the 15-kilogram weight weigh a total of 135 kilos.

If we remove 15 kilos from each plate we are left with two bales of hay that weigh 120 kilograms.

Which means that one bale of hay weighs 60 kilograms.

And one barrel weighs 75 kilograms.

$$x + (x + 15) = 135$$

$$2x + 15 = 135$$

$$\begin{array}{r} -15 \\ -15 \end{array}$$

$$2x = 120$$

$$\begin{array}{r} :2 \\ :2 \end{array}$$

$$x = 60$$

$$x + 15 = 60 + 15 = 75 \text{ kg}$$

VOCABULARY & EXPRESSIONS

- **ELEMENTS OF A EQUATION:** elementos de una ecuación

- **Member:** miembro
- **Term:** término
- **Unknown:** incógnita
- **Degree:** grado
- **Solution:** solución

- **Equivalent equations:** ecuaciones equivalentes

- **FIRST DEGREE EQUATION:** ecuación de primer grado

- **To reduce terms:** reducir términos

- **To transposing terms:** transponer términos

- **To check the solution:** comprobar la solución

- **Equations with denominators:** ecuaciones con denominadores

- **Equations with parentheses:** ecuaciones con paréntesis

- **SECOND DEGREE EQUATION:** ecuación de segundo grado

- **General form:** forma general

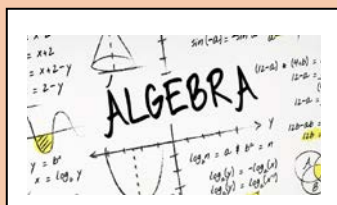
- **Complete equation:** ecuación completa

- **To isolate the unknown:** despejar la incógnita

Which equation can you match to the statements below?

$x + \frac{x}{3} = 20$ $2x + 2(x + 3) = 30$ $15(x - 1) = 5x$

$\frac{x}{3} = \frac{x}{4} + 20$ $3x + 2x = 30$ $15x = 5(x + 1)$



- A third of a number is equal to its quarter plus 20 units. (Number $\rightarrow x$)
- Andrés is triple the age of his sister, and both their ages add up to 20. (Andrés $\rightarrow x$ years)
- A rectangle is 3 metres longer than it is wide and its perimeter is 30 metres. (Width $\rightarrow x$ metres)
- I paid 30 € for 3 drawing pads and a box of paints. But the box cost double the price of a pad. (Pad $\rightarrow x$ euros)
- A cyclist travelled the distance from A to B at the speed of 15 km/h and a person walking at the speed of 5 km/h took 1 hour longer. (Cyclist $\rightarrow x$ hours)
- A cricket moves forward one metre less than a grasshopper with each jump. But in 15 jumps, the cricket travels as far as the grasshopper does in 5 jumps. (Grasshopper $\rightarrow x$ metres)

QUESTIONS & TALK

TRUE OR FALSE?

- The equation $x^2 + 6x - x^2 = 7x - 1$ is second degree.
- The equation $2x + x \cdot y = 6$ is second degree.
- The terms of an equation are the addends that make up the members.
- An equation can have more than 2 members.
- All first degree equations are equivalent
- The equation $x + 1 = 5$ is equivalent to the equation $x + 2 = 6$.

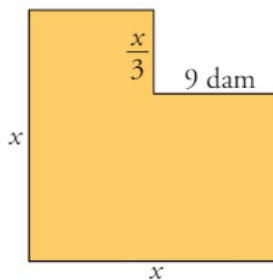
EQUATIONS WITH DENOMINATORS

⇒ **Complete these steps to solve first degree equations with denominators:**

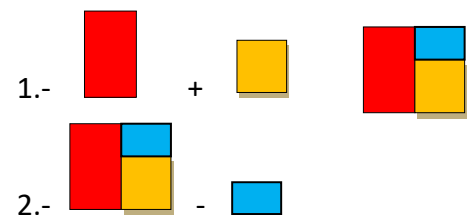
- 1.- When there are denominators in the of a equation, we change the equation into a one that does not have
- 2.- Calculate the least common of the
- 3.- Find the equivalent
- 4.- Simplify the denominators.
- 5.- Isolate the variable on one side, and the constant terms on the other
- 6.- both sides.
- 7.- Find the and check it.

SECOND DEGREE EQUATIONS

Calculate the perimeter of the farm, knowing that the surface is 180 square decametres.



Calculate the perimeter of the farm of two different ways:



SOLVING PROBLEMS WITH EQUATIONS

A hypermarket has a number of washing machines on offer today. It sold half in the morning and one third in the afternoon. If it has sold 20 units in total, how many washing machines in total were on offer?

Ana and her mother cross the street at a zebra crossing. Ana takes 35 steps and her mother only takes 25 steps. If one of her mother's steps is 20 cm longer than Ana's, how long are each of their steps?

