

Algunos veces las ecuaciones parecen no ser tan sencillas, sin embargo, están a unos pequeños pasos de ser ecuaciones lineales.

Problemas

3.16) $3\sqrt{x} - 2 = 30 - \sqrt{x}$

(a) $y = \sqrt{x}$. $3y - 2 = 30 - y$

(b) $4y = 32$
 $y = 8$

(c) $8 = \sqrt{x}$
 $64 = x$

3.17) $\frac{3}{x} - 2 = 7 + \frac{2}{x}$

(a) $x \left(\frac{3}{x} - 2 \right) = x \left(7 + \frac{2}{x} \right)$

(c) $\frac{3}{x} - \frac{2}{x} = 9$

(b) $3 - 2x = 7x + 2$
 $1 = 9x$
 $\frac{1}{9} = x$

(d) $\frac{1}{x} = 9$
 $x = \frac{1}{9}$

3.18)

(a) $\sqrt[3]{2x+1} - 5 + 2\sqrt[3]{2x+1} = -14$

$x = \sqrt[3]{2x+1}$

$x - 5 + 2x = -14$

$3x = -9$

$x = -3$

$\sqrt[3]{2x+1} = -3$

$$2z + 1 = -27$$

$$2z = -28$$

$$z = \underline{-14}$$

$$(b) \quad 2\sqrt{r} + 13 - \sqrt{r} = 9 - \sqrt{r}$$

$$2\sqrt{r} = -4$$

$$\sqrt{r} = -2$$

No tiene solución,

$$(c) \quad \frac{x}{x-1} + \frac{2}{3} = \frac{2}{x-1}$$

$$\frac{x-2}{x-1} = -\frac{2}{3}$$

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

$$5x = 8$$

$$x = \underline{\frac{8}{5}}$$

Exercises

$$3.4.1) \quad \frac{2}{x} - \frac{3}{5} + \frac{1}{x} = \frac{1}{5}$$

$$\frac{3}{x} = \frac{4}{5}$$

$$\underline{\frac{15}{4}} = x$$

3.4.2)

$$4 - \sqrt{2r} = \sqrt{2r} - 6$$

$$4 - \sqrt{2s} = \sqrt{2s} - 6$$

$$10 = 2\sqrt{2r}$$

$$5 = \sqrt{2r}$$

$$25 = 2r$$

$$\boxed{\frac{25}{2}} = r$$

$$4 - 5 = 5 - 5$$

$$-1 = -1$$

3.4.3)

$$\frac{x}{3x-7} = \frac{2}{5}$$

$$5x = 6x - 14$$

$$\boxed{14} = x$$

3.4.4)

$$12 + 2\sqrt[4]{2-z} - 9 = \sqrt[4]{2-z}$$

$$\sqrt[4]{2-z} = -3$$

$$2-z = (-3)^4$$

$$2-z = 81$$

$$-79 = z$$

No hay solución válida.

Revisión:

$$\Leftrightarrow 12 + 2\sqrt[4]{81} - 9 = 3 + 6 = 9$$

$$\Rightarrow \sqrt[4]{2-z} = 3$$

$3 \neq 6$, por lo tanto

-79 es una solución

extraneous.

Recordemos que $\sqrt[4]{2-z}$ está definida como el número positivo cuya cuarta potencia es $2-z$.

3.4.5)

$$\frac{x}{x-1} + \frac{2}{3} = \frac{2}{x-1}$$

$$r = \frac{1}{x-1}$$

$$xr + \frac{2}{3} = 2r$$

$$\frac{2}{3} = 2r - xr$$

$$\frac{2}{3} = r(2-x)$$

$$\frac{2}{3r} = 2-x$$

$$(a) \quad r = \frac{1}{x-1}$$

$$x-1 = \frac{1}{r}$$

$$x = \frac{1}{r} + 1$$

$$(b) \quad \left(\frac{1}{r} + 1\right)r + \frac{2}{3} = 2r$$

$$\frac{3}{3} + r + \frac{2}{3} = 2r$$

$$\frac{5}{3} = r$$

Substituyendo...

$$\frac{5}{3}x + \frac{2}{3} = 2\left(\frac{5}{3}\right)$$

$$\frac{5}{3}x = \frac{10}{3} - \frac{2}{3}$$

$$\frac{5}{3}x = \frac{8}{3}$$

$$5x = 8$$

$$x = \boxed{\frac{8}{5}}$$