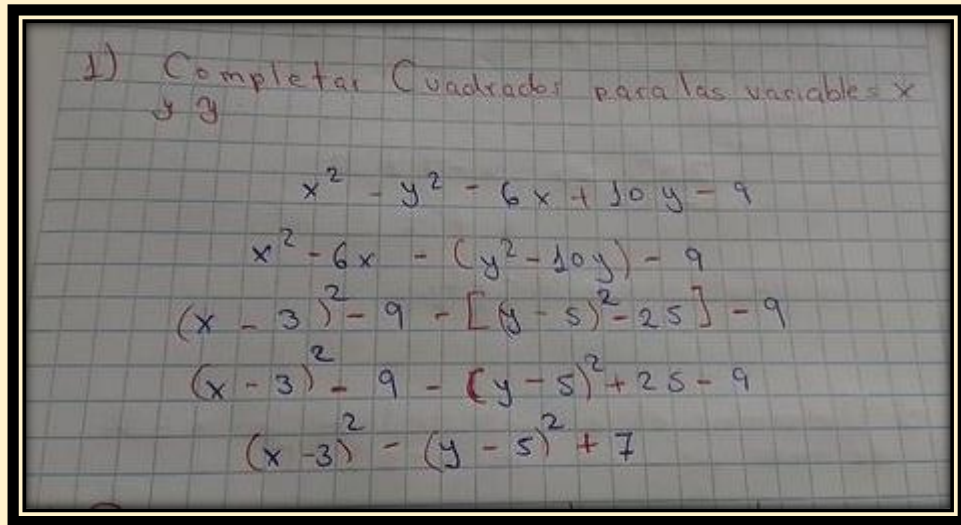


EXAMEN DE ENTRADA

1.-) Completar cuadrados para las variables x y y

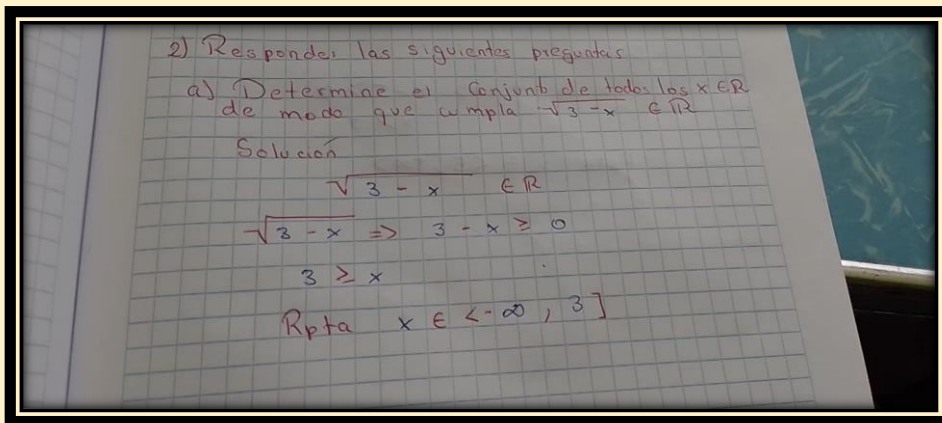


1) Completar Cuadrados para las variables x y y

$$x^2 - y^2 - 6x + 10y - 9$$
$$x^2 - 6x - (y^2 - 10y) - 9$$
$$(x - 3)^2 - 9 - [(y - 5)^2 - 25] - 9$$
$$(x - 3)^2 - 9 - (y - 5)^2 + 25 - 9$$
$$(x - 3)^2 - (y - 5)^2 + 7$$

2.-) Responder a las preguntas siguientes

a.-)



2) Responder las siguientes preguntas

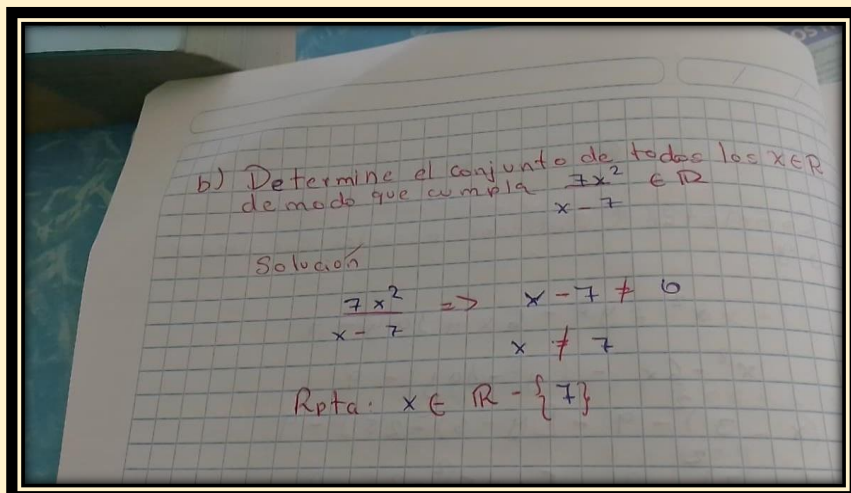
a) Determine el conjunto de todos los $x \in \mathbb{R}$ de modo que cumpla $\sqrt{3-x} \in \mathbb{R}$

Solución

$$\sqrt{3-x} \in \mathbb{R}$$
$$\sqrt{3-x} \Rightarrow 3-x \geq 0$$
$$3 \geq x$$

Rpta $x \in (-\infty, 3]$

b.-)



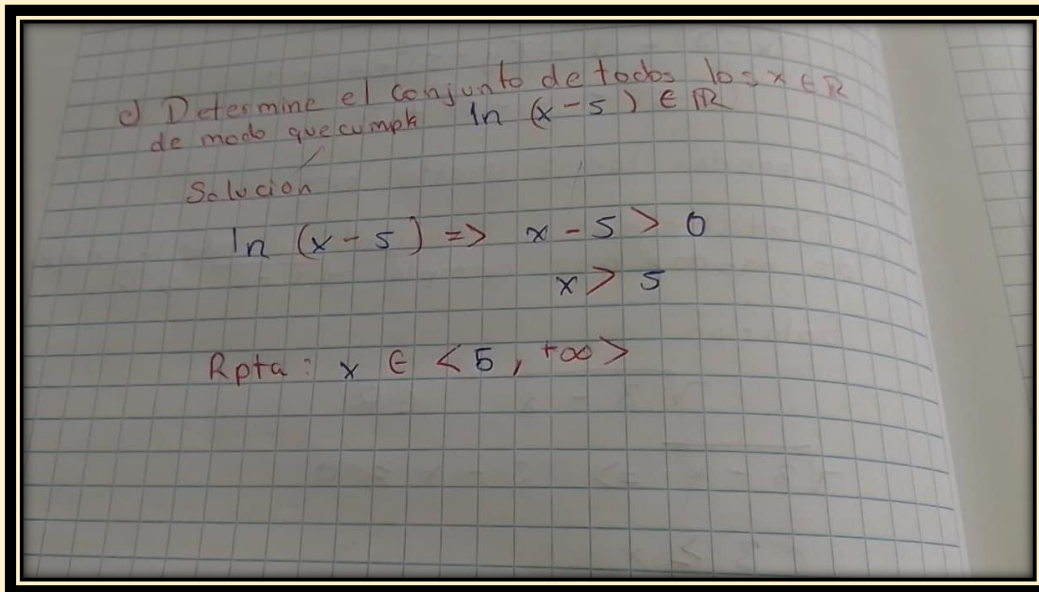
b) Determine el conjunto de todos los $x \in \mathbb{R}$ de modo que cumpla $\frac{7x^2}{x-7} \in \mathbb{R}$

Solución

$$\frac{7x^2}{x-7} \Rightarrow x-7 \neq 0$$
$$x \neq 7$$

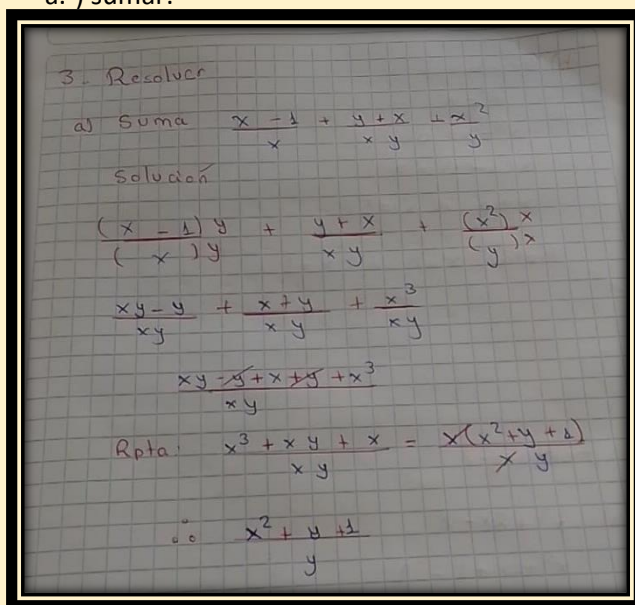
Rpta: $x \in \mathbb{R} - \{7\}$

c.-)

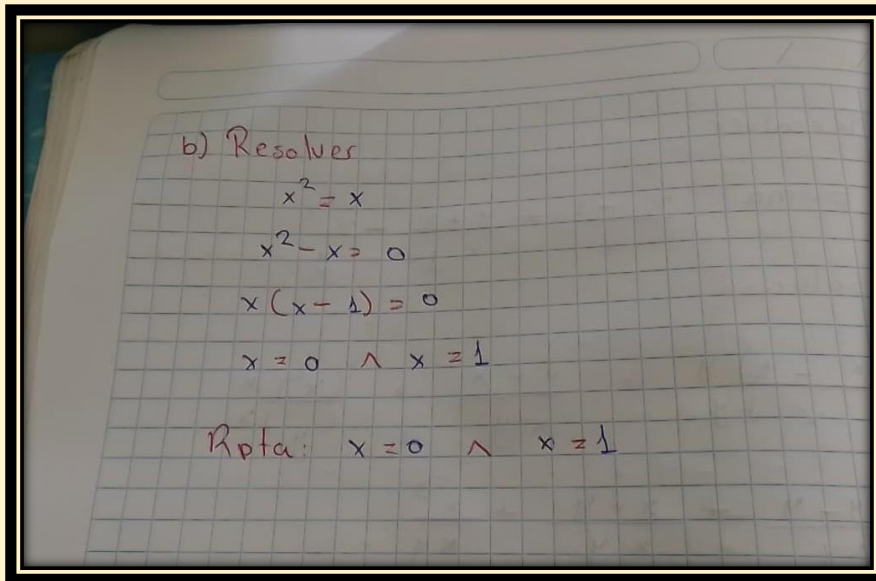


3.-) Resolver

a.-) sumar:



b.-) Resolver:

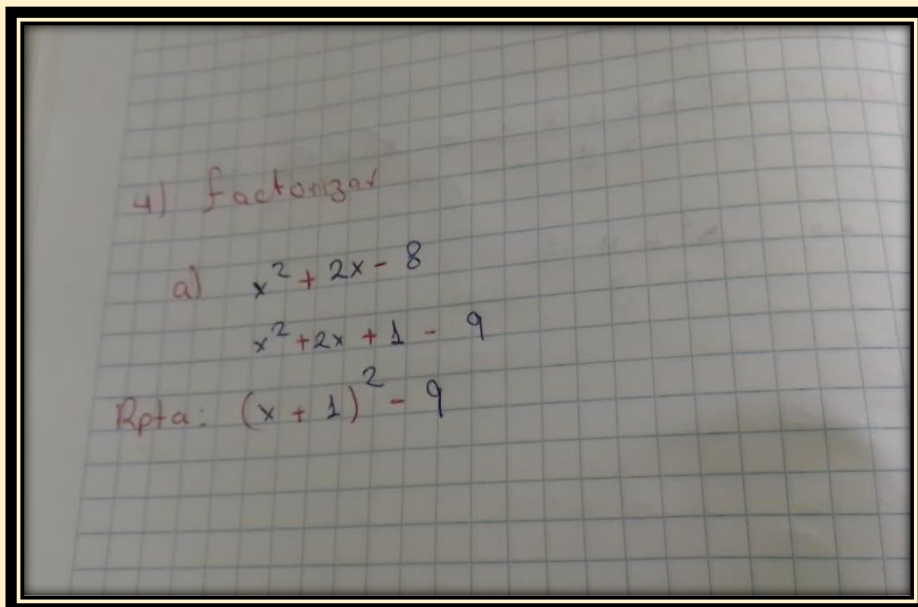


A photograph of a piece of graph paper with handwritten mathematical work. The text is written in red ink. It shows the steps to solve the equation $x^2 = x$ by subtracting x from both sides to get $x^2 - x = 0$, then factoring to $x(x-1) = 0$, and finally stating the solutions $x = 0$ and $x = 1$.

$$\begin{aligned} \text{b) Resolver} \\ x^2 &= x \\ x^2 - x &= 0 \\ x(x-1) &= 0 \\ x = 0 \wedge x &= 1 \\ \text{Rpta: } x = 0 \wedge x &= 1 \end{aligned}$$

4.-) factorizar

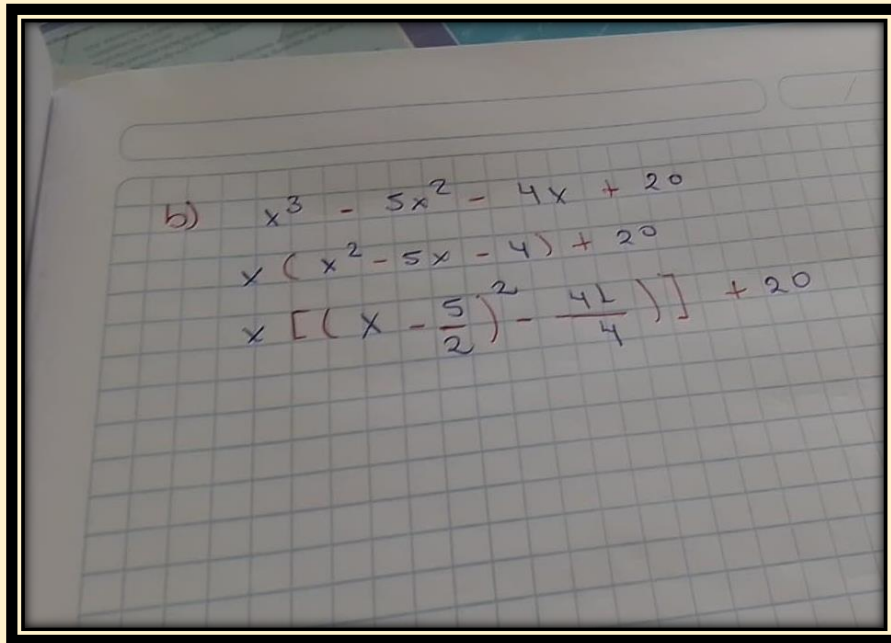
a.-)



A photograph of a piece of graph paper with handwritten mathematical work. The text is written in red ink. It shows the steps to factorize the expression $x^2 + 2x - 8$ by adding and subtracting 1 to complete the square, resulting in $(x+1)^2 - 9$.

$$\begin{aligned} \text{4) factorizar} \\ \text{a) } x^2 + 2x - 8 \\ x^2 + 2x + 1 - 9 \\ \text{Rpta: } (x+1)^2 - 9 \end{aligned}$$

b.-)



The image shows a photograph of a piece of grid paper with handwritten mathematical work. The work is as follows:

$$\begin{aligned} \text{b)} \quad & x^3 - 5x^2 - 4x + 20 \\ & x(x^2 - 5x - 4) + 20 \\ & x \left[\left(x - \frac{5}{2} \right)^2 - \frac{41}{4} \right] + 20 \end{aligned}$$

5.-) Simplificar

⑤ Simplificar

$$a) \frac{x^3 - 1}{x^3 + 2x^2 + 2x + 1}$$

$$(x - 1)(x^2 + x + 1)$$

$$\left(x - \frac{2}{3}\right)^3 + \frac{2x}{3} + \frac{35}{27}$$

//

$$b) \frac{\sqrt[3]{x^3 - 1}}{x - 1}$$

Sol:

$$\frac{\sqrt[3]{x^3 - 1 + x - x}}{x - 1}$$

$$\frac{\sqrt[3]{x^3 + x^3 - 1 - x}}{x - 1}$$

$$\text{Sol: } \frac{\sqrt[3]{x^3 - x^3 + 1}}{x - 1} //$$

6.-)

⑥ Sean $a, b \in \mathbb{R}$ de modo que $1 < a$ y $a < b$. Ubicar en la recta de los números reales los números $a, b, \frac{1}{a}, \frac{a-1}{a}$ y $b+2$.

Resolución

