

RESOLVER

1 Resuelve:

$$a) \begin{cases} \frac{1}{x} + \frac{1}{y} = \frac{5}{6} \\ 2x + 3y = 2 \end{cases}$$

$$b) \begin{cases} x \cdot y = 15 \\ \frac{x}{y} = \frac{5}{3} \end{cases}$$

$$c) \begin{cases} x^2 + y^2 - 5x - 5y + 10 = 0 \\ x^2 - y^2 - 5x + 5y + 2 = 0 \end{cases}$$

$$d) \begin{cases} (x + y)(x - y) = 7 \\ 3x - 4y = 0 \end{cases}$$

2 Resuelve:

$$a) \begin{cases} y^2 - 2y + 1 = x \\ \sqrt{x} + y = 5 \end{cases}$$

$$b) \begin{cases} 2\sqrt{x+1} = y + 1 \\ 2x - 3y = 1 \end{cases}$$

$$c) \begin{cases} \sqrt{3(x+y)} + x = 12 \\ 2x - y = 6 \end{cases}$$

$$d) \begin{cases} \sqrt{x+y} + 2 = x + 1 \\ 2x - y = 5 \end{cases}$$

3 Resuelve los siguientes sistemas de ecuaciones:

$$a) \begin{cases} 3x^2 - 5y^2 = 7 \\ 2x^2 = 11y^2 - 3 \end{cases}$$

$$b) \begin{cases} 2\sqrt{x} = 3 + y \\ \frac{y+6}{9} + \frac{4(x-9)}{9y} = 3 \end{cases}$$

4 Resuelve:

$$a) \begin{cases} \log x + \log y = 3 \\ \log x - \log y = -1 \end{cases}$$

$$b) \begin{cases} \log_2 x + 3\log_2 y = 5 \\ \log_2 \frac{x^2}{y} = 3 \end{cases}$$

$$c) \begin{cases} \log(x^2y) = 2 \\ \log x = 6 + \log y^2 \end{cases}$$

$$d) \begin{cases} x^2 - y^2 = 11 \\ \log x - \log y = 1 \end{cases}$$

$$e) \begin{cases} x - y = 25 \\ \log y = \log x - 1 \end{cases}$$

$$f) \begin{cases} \ln x - \ln y = 2 \\ \ln x + \ln y = 4 \end{cases}$$

5 Resuelve:

$$a) \begin{cases} \sqrt{x+y} - \sqrt{x-y} = \sqrt{2x} \\ x + y = 8 \end{cases}$$

$$b) \begin{cases} \sqrt{4y+2x} = \sqrt{3y+x} - 1 \\ y + x = -5 \end{cases}$$

$$c) \begin{cases} (x+3)(y-5) = 0 \\ (x-2)(y-1) = 0 \end{cases}$$

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$$1 \quad a) \left. \begin{array}{l} 6y + 6x = 5xy \\ y = \frac{2-2x}{3} \end{array} \right\} \begin{array}{l} 4 - 4x + 6x = \frac{5x(2-2x)}{3} \\ 6x + 12 = 10x - 10x^2 \\ 10x^2 - 4x + 12 = 0 \end{array}$$

$$5x^2 - 2x + 6 = 0$$

No tiene solución.

$$b) x = \frac{5y}{3}$$

$$\frac{5y^2}{3} = 15; y^2 = 9 \begin{cases} y = 3 \rightarrow x = 5 \\ y = -3 \rightarrow x = -5 \end{cases}$$

$$x_1 = 5, y_1 = 3; x_2 = -5, y_2 = -3$$

$$c) 2x^2 - 10x + 12 = 0; x^2 - 5x + 6 = 0$$

$$x = \frac{5 \pm \sqrt{25 - 24}}{2} = \frac{5 \pm 1}{2} = \begin{array}{l} 3 \\ 2 \end{array}$$

$$x^2 + y^2 - 5x - 5y + 10 = 0$$

$$-x^2 + y^2 + 5x - 5y - 2 = 0$$

$$\hline 2y^2 - 10y + 8 = 0$$

$$y^2 - 5y + 4 = 0$$

$$y = \frac{5 \pm \sqrt{25 - 16}}{2} = \frac{5 \pm 3}{2} = \begin{array}{l} 4 \\ 1 \end{array}$$

$$x_1 = 3, y_1 = 4; x_2 = 3, y_2 = 1; x_3 = 2, y_3 = 4; x_4 = 2, y_4 = 1$$

$$d) x = \frac{4y}{3}$$

$$\frac{7y}{3} \cdot \frac{y}{3} = 7$$

$$y^2 = 9; y = \pm 3$$

$$x_1 = 4, y_1 = 3; x_2 = -4, y_2 = -3$$

$$2 \quad a) x = (5 - y)^2$$

$$y^2 - 2y + 1 = 25 + y^2 - 10y$$

$$8y = 24; y = 3; x = 4$$

$$x = 4; y = 3$$

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b) $4x + 4 = y^2 + 1 + 2y; x = \frac{y^2 + 2y - 3}{4}$

$x = \frac{1 + 3y}{2} = \frac{2 + 6y}{4}$

$y^2 + 2y - 3 = 2 + 6y$

$y^2 - 4y - 5 = 0$

$y = \frac{4 \pm \sqrt{16 + 20}}{2} = \frac{4 \pm 6}{2} = \begin{matrix} 5 \rightarrow x = 8 \\ -1 \rightarrow x = -1 \end{matrix}$

$x_1 = -1, y_1 = -1; x_2 = 8, y_2 = 5$

c) $y = 2x - 6$

$\sqrt{3(3x - 6)} = 12 - x$

$9x - 18 = 144 + x^2 - 24x$

$0 = x^2 - 33x + 162$

$x = \frac{33 \pm 21}{2} = \begin{matrix} 27 \rightarrow y = 48 \text{ (no vale)} \\ 6 \rightarrow y = 6 \end{matrix}$

$x = 6; y = 6 \text{ (} x = 27, y = 48 \text{ no vale)}$

d) $y = 2x - 5$

$\sqrt{3x - 5} = x - 1$

$3x - 5 = x^2 + 1 - 2x$

$0 = x^2 - 5x + 6$

$x = \frac{5 \pm \sqrt{25 - 24}}{2} = \frac{5 \pm 1}{2} = \begin{matrix} 3 \rightarrow y = 1 \\ 2 \rightarrow y = -1 \end{matrix}$

$x_1 = 2, y_1 = -1; x_2 = 3, y_2 = 1$

3 a) $\left. \begin{matrix} 3x^2 - 5y^2 = 7 \\ 2x^2 - 11y^2 = -3 \end{matrix} \right\} \begin{matrix} 6x^2 - 10y^2 = 14 \\ -6x^2 + 33y^2 = 9 \end{matrix}$

$23y^2 = 23; y = \pm 1$

$33x^2 - 55y^2 = 77$

$-10x^2 + 55y^2 = 15$

$23x^2 = 92$

$x^2 = 4; x = -2$

$x_1 = 2, y_1 = 1; x_2 = 2, y_2 = -1; x_3 = -2, y_3 = 1; x_4 = -2, y_4 = -1$

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b) $4x = 9 + y^2 + 6y$

$$y^2 + 6y + 4x - 36 = 27y$$

$$y^2 + 6y + 9 + y^2 + 6y - 36 = 27y$$

$$2y^2 - 15y - 27 = 0$$

$$y = \frac{15 \pm 21}{4} = \begin{matrix} 9 \rightarrow x = 36 \\ -3/2 \rightarrow x = 9/16 \end{matrix}$$

$$x_1 = 36, y_1 = 9; x_2 = \frac{9}{16}, y_2 = \frac{-3}{2}$$



a) $2 \log x = 2$

$$x = 10; y = 100$$

$$\left. \begin{array}{l} b) \log_2 x + 3 \log_2 y = 5 \\ 2 \log_2 x - \log_2 y = 3 \end{array} \right\} \begin{array}{l} \log_2 x + 3 \log_2 y = 5 \\ 6 \log_2 x - 3 \log_2 y = 9 \\ \hline 7 \log_2 x = 14 \end{array}$$

$$x = 4; y = 2$$

$$\left. \begin{array}{l} c) 2 \log x + \log y = 2 \\ \log x - 2 \log y = 6 \end{array} \right\} \begin{array}{l} 4 \log x + 2 \log y = 4 \\ \log x - 2 \log y = 6 \\ \hline 5 \log x = 10 \rightarrow \log x = 2 \end{array}$$

$$\left. \begin{array}{l} x = 100 \\ y = \frac{1}{100} \end{array} \right\}$$

d) $\log \frac{x}{y} = 1; \frac{x}{y} = 10; x = 10y$

$$100y^2 - y^2 = 11; 99y^2 = 11; y^2 = \frac{1}{9} \rightarrow y = \pm \frac{1}{3}$$

$$x = \frac{10}{3}; y = \frac{1}{3}$$

$$\left(y = -\frac{1}{3} \text{ no vale} \right)$$

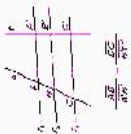
$$\left. \begin{array}{l} e) x = 25 + y \\ \log \frac{y}{x} = -1 \end{array} \right\} \begin{array}{l} y = 0,1x \\ 0,9x = 25 \end{array}$$

$$x = \frac{250}{9}; y = \frac{25}{9}$$

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$$f) \begin{cases} \ln x - \ln y = 2 \\ \ln x + \ln y = 4 \end{cases} \quad \begin{array}{l} \text{Sumando las dos ecuaciones, queda:} \\ 2 \ln x = 6 \rightarrow \ln x = 3 \rightarrow x = e^3 \end{array}$$

Restando a la 2ª ecuación la 1ª, queda:

$$2 \ln y = 2 \rightarrow \ln y = 1 \rightarrow y = e$$

$$\text{Solución: } x = e^3; y = e$$



a) $y = 8 - x$

$$\sqrt{8} - \sqrt{2x - 8} = \sqrt{2x}$$

$$\sqrt{2x - 8} = \sqrt{8} - \sqrt{2x}$$

$$2x - 8 = 8 + 2x - 2\sqrt{16x}$$

$$2\sqrt{16x} = 16$$

$$8\sqrt{x} = 16$$

$$\sqrt{x} = 2$$

$$x = 4; y = 4$$

b) $x = -5 - y$

$$\sqrt{4y - 10 - 2y} = \sqrt{3y - 5 - y} - 1$$

$$\sqrt{2y - 10} = \sqrt{2y - 5} - 1$$

$$2y - 10 = 2y - 5 + 1 - 2\sqrt{2y - 5}$$

$$2\sqrt{2y - 5} = 6$$

$$\sqrt{2y - 5} = 3$$

$$2y - 5 = 9$$

$$x = -12; y = 7$$

c) $x_1 = -3, y_1 = 1; x_2 = 2, y_2 = 5$