REPASO FINAL EXTRAORDINARIA

FICHA ECUACIONES Y SISTEMAS NO LINEALES

1.

a) $2^{3x} = 0{,}5^{3x+2}$ b) $3^{4-x^2} = \frac{1}{9}$ c) $\frac{4^{x+1}}{2^{x+2}} = 186$ d) $7^{x+2} = 5764801$

1.

a) $3^x + 3^{x+2} = 30$

b) $5^{x+1} + 5^x + 5^{x-1} = \frac{31}{5}$

c) $2\log x - \log(x+6) = 3\log 2$

d) $4\log_2(x^2+1) = \log_2 625$

2.

a) $\begin{cases} 2x - y - 1 = 0 \\ x^2 - 7 = y + 2 \end{cases}$

b) $\begin{cases} \frac{1}{x} + \frac{1}{y} = 1 - \frac{1}{xy} \\ xy = 6 \end{cases}$

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

d) $\begin{cases} y^2 - x^2 = 16 \\ \sqrt{5-4y} - x = -(x+y) \end{cases}$

3.

a) $\begin{cases} x^2 + xy + y^2 = 21 \\ x + y = 1 \end{cases}$

b) $\begin{cases} \log(x^2+y) - \log(x-2y) = 1 \\ 5^{x+1} = 25^{y+1} \end{cases}$

c) $\begin{cases} x - y = 27 \\ \log x - 1 = \log y \end{cases}$

d) $\begin{cases} \log(2x - y^2) = \log(2-y) + 1 \\ 3^{x-1} = 27^{y+3} \end{cases}$

4.

a) $3^{x^2+1} - 9^x = 0$ b) $\left(\frac{1}{2}\right)^{-x-1} = 5$ c) $2^{2x} - 3 \cdot 2^x + 2 = 0$

5.

a) $\log x + \log 4 = 2$ b) $2\log x - \log(x-1) = \log 4$

6.

$x^8 - 15x^4 - 16 = 0$

7.

a) $\begin{cases} 2^x + 3^y = 17 \\ 2^{2x} - 3^{y-1} = 61 \end{cases}$

b) $\begin{cases} 3\ln x - \ln y = 1 \\ \ln x^3 + \ln y^2 = 7 \end{cases}$

c) $\begin{cases} x^2 + y = 0 \\ 3^{x-1} = \frac{3^{y^2+1}}{9} \end{cases}$

8.

a) $\sqrt{2x} + \sqrt{5x-6} = 4$ b) $\sqrt{x-2} + \sqrt{x+1} = 3$ c) $\sqrt{\frac{7x+1}{4}} = \frac{5x-7}{6}$ d) $\sqrt{\frac{1}{x}} = \frac{x}{8}$

9.

a) $\sqrt{3x} - \sqrt{x} - \sqrt{2} = 0$

b) $\sqrt{-5-7x} + \sqrt{4+x} = \sqrt{7-6x}$

c) $\sqrt[3]{4x-1} = x-4$

d) $\sqrt[3]{4-2x} = \sqrt[6]{8x^2-16x}$

e) $\sqrt{2x+2} - \sqrt[4]{6x+10} = 0$

f) $\sqrt[4]{3x+1} = 4 - \sqrt[4]{3x+1}$

10.

a) $3^{x^2+1} = \frac{1}{9}$

b) $\frac{9^{2x}}{3^x} = 27$

c) $5 \cdot 2^{x+3} = \frac{5}{4}$

d) $5^{x^2+3x} = 0{,}04$

e) $\left(\frac{2}{3}\right)^x = \frac{8}{27}$

f) $\left(\frac{1}{9}\right)^x = 81$

g) $(0{,}01)^x = 100$

h) $3^{x+1} \cdot 2^{x+1} = 36$

i) $\sqrt{2^{3x-1}} = 0{,}125$

j) $3\sqrt[3]{27^{x-1}} = \left(\frac{1}{9}\right)^{2x+5}$

k) $3 \cdot 9^x \cdot 27^x = 1$

l) $5^{x-5} \cdot 125^{2x} = 25$

11.

a) $\frac{1}{e^x} = 27$

b) $e^{x-9} = \sqrt{73}$

c) $2^x \cdot 3^x = 81$

d) $\frac{2^x}{3^{x+1}} = 1$

e) $2^{x+1} \cdot 16^{2x+1} = 3$

f) $\left(\frac{1}{5}\right)^x \cdot 125^{x+1} = 4$

12.

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

b) $2^{x+1} + 2^{x-1} = \frac{5}{2}$

c) $8^{1+x} + 2^{3x-1} = \frac{17}{16}$

d) $2^{2x} - 5 \cdot 2^x + 4 = 0$

e) $9^x - 3^x - 6 = 0$

f) $7^{1+2x} - 50 \cdot 7^x + 7 = 0$

g) $2^{x/2} + 2^x = 6$

h) $\sqrt{3^{2x}+7} = 3^x + 1$

i) $2^{3x} - 3 \cdot 2^{2x+1} + 3 \cdot 2^{x+2} = 8$

13.

a) $\log(x^2+1) - \log(x^2-1) = \log\frac{13}{12}$

b) $\ln(x-3) + \ln(x+1) = \ln 3 + \ln(x-1)$

c) $(x-1)\log(3^{x+1}) = 3\log 3$

d) $\log(x+3) - \log(x-6) = 1$

14.

a) $\log_5(x^2-2x+5) = 1$

b) $\log\sqrt{3x+5} + \log\sqrt{x} = 1$

c) $2(\log x)^2 + 7\log x - 9 = 0$

d) $\frac{1}{2}\log_{11}(x+5) = 1$

e) $\log(x^2+3x+36) = 1 + \log(x+3)$

f) $\ln x + \ln 2x + \ln 4x = 3$

15.

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

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

c) $\begin{cases} x^2 + y^2 = 10 \\ 2y - x = 7 \end{cases}$

d) $\begin{cases} x^2 - y^2 = 5 \\ xy = 6 \end{cases}$

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

16.

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

17.

a) $\begin{cases} y - x = 1 \\ 2^x + 2^y = 12 \end{cases}$ b) $\begin{cases} e^x - e^{y+1} = 1 \\ x^2 + y^2 = 1 \end{cases}$ c) $\begin{cases} 5^x \cdot 5^y = 1 \\ 5^x : 5^y = 25 \end{cases}$

d) $\begin{cases} 10^x \cdot 10^{y^2-1} = 0,1 \\ \dfrac{2^{2x}}{2^{y-1}} = 0,25 \end{cases}$ e) $\begin{cases} 3^{2x} + 3^{y-1} = 4 \\ 3^{x+1} + 3^y = 12 \end{cases}$ f) $\begin{cases} 2^{2x} + 2^y = \dfrac{1}{2} \\ 2^{2(x-y)} = 4 \end{cases}$

18.

a) $\begin{cases} \log x + \log y = 3 \\ \log x - \log y = -1 \end{cases}$ b) $\begin{cases} \log_2 x + 3\log_2 y = 5 \\ \log_2 \dfrac{x^2}{y} = 3 \end{cases}$ c) $\begin{cases} \log(x^2 y) = 2 \\ \log x = 6 + \log y^2 \end{cases}$

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