ECUACIONES EXPONENCIALES

$2^x = 7$ (VARIABLE)

$\ln 2^x = \ln 7$

$x \ln 2 = \ln 7$

$x = \dfrac{\ln 7}{\ln 2}$

≈ 2.807

SECUENCIA

1. Aislar la Exp. Exponencial
2. Aplicar logaritmo a ambos lados de la ecuación
3. Despejar la variable

i1:

$$3^{x+2} = 7$$

$$\log(3^{x+2}) = \log 7$$

$$(x+2)\log 3 = \log 7$$

$$x+2 = \frac{\log 7}{\log 3}$$

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

$$\boxed{x \approx -0.228756}$$

12:

$$8e^{2x} = 20$$

$$e^{2x} = 20/8$$

$$\ln e^{2x} = \ln 2.5$$

$$2x = \ln 2.5$$

$$x = \frac{\ln 2.5}{2}$$

$$\boxed{x \approx 0.458}$$

ALGEBRAIC

3:

$$e^{3-2x} = 4$$

$$\ln\left(e^{3-2x}\right) = \ln 4$$

$$3-2x = \ln 4$$

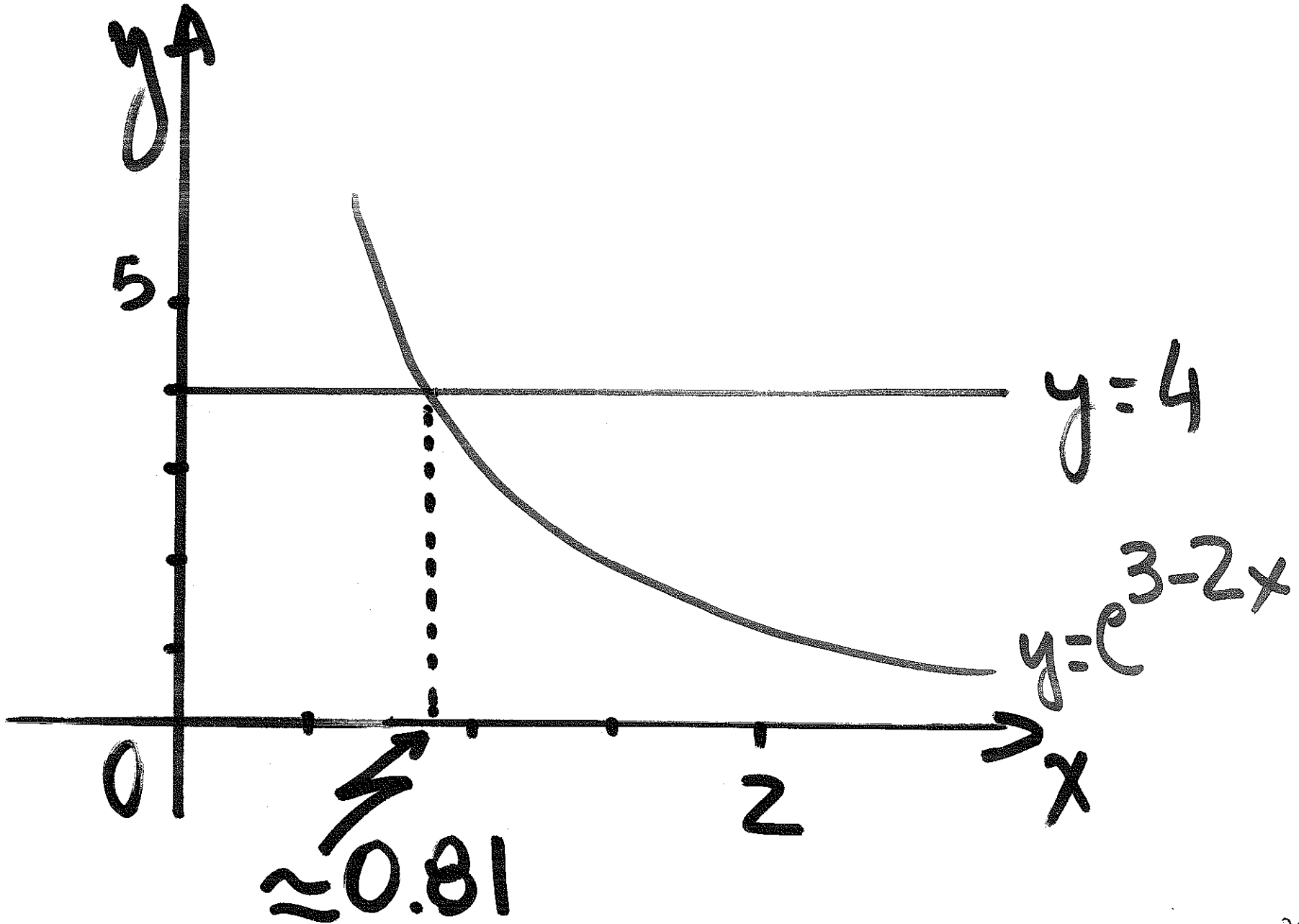
$$2x = 3 - \ln 4$$

$$x = \frac{1}{2}(3 - \ln 4)$$

$$\boxed{x \approx 0.807}$$

$e^{3-2x} = 4$

GRAFICO



Ej 4:

$$e^{2x} - e^x - 6 = 0$$

$$(e^x)^2 - e^x - 6 = 0$$

$$(e^x - 3)(e^x + 2) = 0$$

$e^x - 3 = 0$ $\qquad$ $(e^x + 2) = 0$

$e^x = 3$ $\qquad$ $e^x = -2$

$x = \ln 3$ $\qquad$ No sol. $\rightarrow e^x > 0$

15:

$$3xe^x + x^2e^x = 0$$

$$x(3+x)e^x = 0$$

$$x(3+x) = 0$$

$x = 0$

$3+x=0 \Rightarrow x=-3$

—COMPROBAR—

$x = 0$:

$$3(0)e^0 + 0^2 e^0 = 0$$ OK

$x = -3$:

$$3(-3)e^{-3} + (-3)^2 e^{-3} = 0$$

$$-9e^{-3} + 9e^{-3} = 0$$ OK

ECUACIONES LOGARITMICAS

$\log_2(x+2) = 5$ VARIABLE

$x + 2 = 2^5$

$x = 32 - 2$

$\boxed{x = 30}$

Otra forma:

$$\log_2(x+2) = 5$$

$$2^{[\log_2(x+2)]} = 2^5$$

$$x + 2 = 2^5$$

$$x = 32 - 2$$

$$\boxed{x = 30}$$

SECUENCIA

1. Aislar el término logarítmico.
2. Escribir la Ec. en forma exponencial.
3. Despejar la variable.

Ej6:

$\ln x = 8$

$x = e^8$

$\boxed{x \approx 2981}$

$\ln x = 8$

$e^{\ln(x)} = e^8$

$x = e^8$

$\boxed{x \approx 2981}$

17:

$$4 + 3\log(2x) = 16$$

$$4 + 3\log(2x) - 4 = 16 - 4 \quad \rightarrow 12$$

$$\frac{3\log(2x)}{3} = \frac{12}{3} \quad \rightarrow 4$$

$$2x = 10^4$$

$$\boxed{x = 5000}$$

#8: $\log[(x+2)(x-1)] = 1$

$(x+2)(x-1) = 10$

$x^2 + x - 2 = 10$

$x^2 + x - 12 = 0$

$(x+4)(x-3) = 0$

$x = -4$ $\quad$ $x = 3$

COMPROBAR

$x = -4$:

$$\log(-4+2) + \log(-4-1) =$$

$$= \log(-2) + \log(-5) \quad \text{INDEF.}$$

$x = 3$:

$$\log(3+2) + \log(3-1) =$$

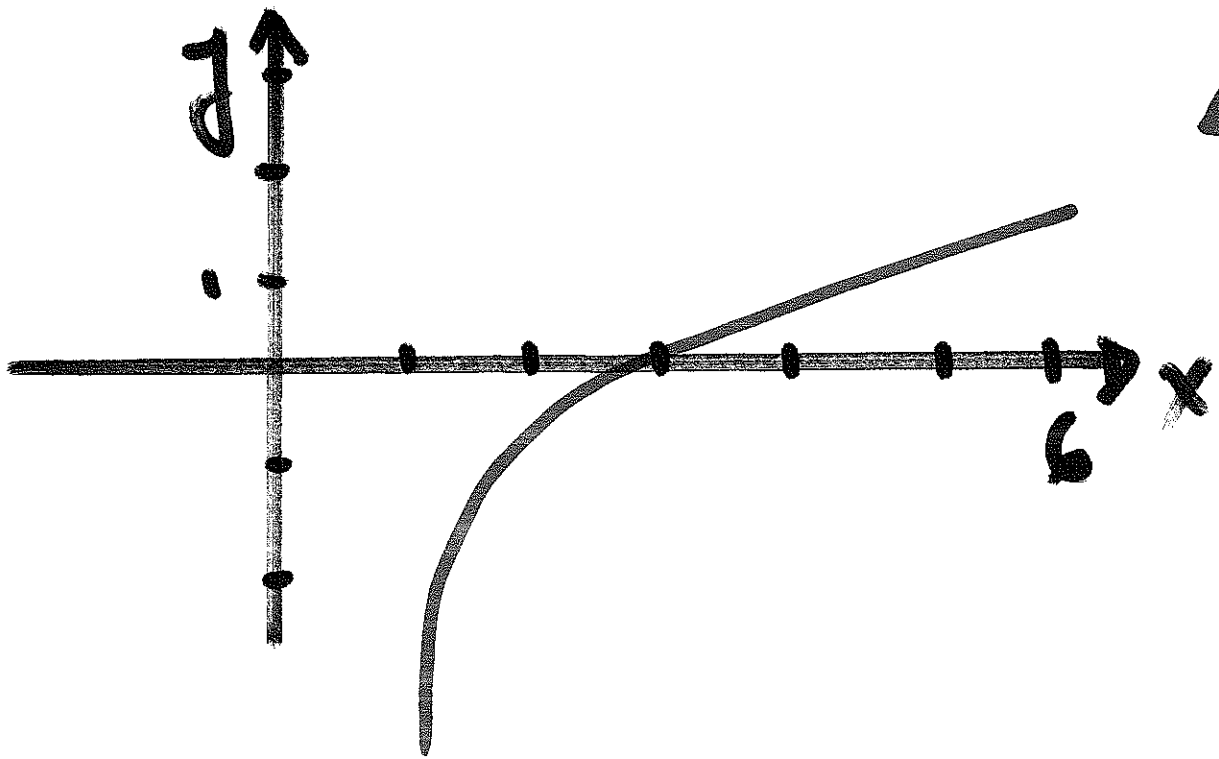
$$= \log 5 + \log 2 = \log(5 \cdot 2) = 1 \quad \text{OK}$$

GRAFICAMENTE

$$\log[(x+2)(x-1)] = 1$$

$$\log(x+2) + \log(x-1) - 1 = 0$$

$$y = \log(x+2) + \log(x-1) - 1$$



Aplicaciones

→ .pptx