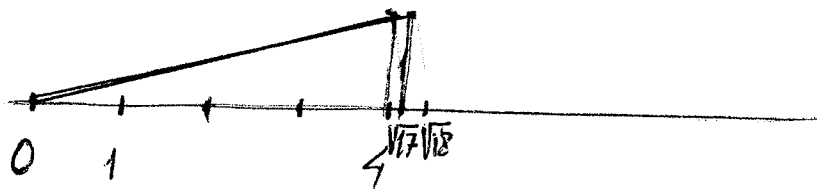


EXAMEN DE MAT. APLICADAS I. N° REAL. MATEMÁTICA FINANCIERA.

1.  $\sqrt{18}$

$$\sqrt{18} = \sqrt{1^2 + (\sqrt{17})^2}$$

$$\sqrt{17} = \sqrt{1^2 + 4^2}$$



2.

a)  $\sqrt{8ab} \cdot \sqrt[3]{a^2b} = \sqrt[6]{(8ab)^3} \cdot \sqrt[6]{(a^2b)^2} = \sqrt[6]{2^9 a^3 b^3 a^4 b^2} = \sqrt[6]{2^9 a^7 b^5} = 2a \sqrt[6]{2^3 a b^5}$

b)  $2\sqrt{98} - \sqrt{\frac{2}{81}} + \frac{1}{2}\sqrt{72} = 2\sqrt{2 \cdot 7^2} - \sqrt{\frac{2}{3^4}} + \frac{1}{2}\sqrt{2^3 \cdot 3^2} = 2 \cdot 7\sqrt{2} - \frac{1}{9}\sqrt{2} + \frac{1}{2} \cdot 2 \cdot 3\sqrt{2} = 14\sqrt{2} - \frac{1}{9}\sqrt{2} + 3\sqrt{2} = (14 - \frac{1}{9} + 3)\sqrt{2} = \frac{152}{9}\sqrt{2}$

c)  $(2\sqrt{5} - 3\sqrt{2})^2 = (2\sqrt{5})^2 - 2 \cdot 2\sqrt{5} \cdot 3\sqrt{2} + (3\sqrt{2})^2 = 20 - 12\sqrt{10} + 18 = 38 - 12\sqrt{10}$

d)  $\frac{\sqrt{8}}{3\sqrt{2} - 2} = \frac{\sqrt{8}(3\sqrt{2} + 2)}{(3\sqrt{2} - 2)(3\sqrt{2} + 2)} = \frac{\sqrt{8}(3\sqrt{2} + 2)}{(3\sqrt{2})^2 - 2^2} = \frac{\sqrt{8}(3\sqrt{2} + 2)}{18 - 4} = \frac{\sqrt{8}(3\sqrt{2} + 2)}{14} = \frac{3\sqrt{16} + 2\sqrt{8}}{14} = \frac{12 + 4\sqrt{2}}{14} = \frac{6 + 2\sqrt{2}}{7}$

3. a)  $|x+2| > 9 \Rightarrow \begin{cases} x+2 < -9 \\ x+2 > 9 \end{cases} \Rightarrow \begin{cases} x < -11 \\ x > 7 \end{cases} \text{ SOL: } (-\infty, -11) \cup (7, \infty)$

b)  $|x-1| \leq 6 \Rightarrow -6 \leq x-1 \leq 6 \Rightarrow -6+1 \leq x \leq 6+1 \Rightarrow -5 \leq x \leq 7$   
 SOL:  $[-5, 7]$

c)  $|x| > 4 \Rightarrow \begin{cases} x < -4 \\ x > 4 \end{cases} \text{ SOL: } (-\infty, -4) \cup (4, \infty)$

d)  $x / x \leq -1 \text{ SOL } (-\infty, -1]$

4.

$$a) \log_8 512 = x \Rightarrow 8^x = 512 \Rightarrow 2^{3x} = 2^9 \Rightarrow 3x = 9 \Rightarrow \boxed{x = 3} \quad 0,5$$

$$b) \log(x-1) = 2 \Rightarrow 10^2 = x-1 \Rightarrow 100 = x-1 \Rightarrow x = 100+1 \Rightarrow \boxed{x = 101} \quad 0,5$$

$$c) 1,005^x = 1,875 \Rightarrow x \log 1,005 = \log 1,875 \Rightarrow x = \frac{\log 1,875}{\log 1,005} = 126,036 \quad 0,5$$

$$d) \log_x \frac{1}{27} = -3 \Rightarrow x^{-3} = \frac{1}{27} \Rightarrow \frac{1}{x^3} = \frac{1}{27} \Rightarrow x^3 = 27 \Rightarrow x = \sqrt[3]{27} = 3 \quad 0,5$$

5.

$$a) 200.000 \cdot 0,85 \cdot 0,925 \cdot 1,055 = 165.898,75 \text{ €}$$

$$b) 0,85 \cdot 0,925 \cdot 1,055 = 0,8295 \text{ (índice de variación global)}$$

$$(1 - 0,8295) \cdot 100 = 17,05\% \text{ de DISMINUCIÓN PORCENTUAL GLOBAL}$$

6.

15.000 € 2,4% anual, 2 años, capitalización trimestral

$$C_f = 15.000 \left(1 + \frac{0,024}{4}\right)^{2 \cdot 4} = 15.735,30 \text{ €} \quad 1$$

7. 80.000 € , 15 años y 7 meses, a? , 3,5% anual

$$C = \frac{a(1+r)[(1+r)^t - 1]}{r}; 80.000 = \frac{a \left(1 + \frac{0,035}{12}\right) \left[\left(1 + \frac{0,035}{12}\right)^{187} - 1\right]}{\frac{0,035}{12}}$$

$$\Rightarrow a = \frac{80.000 \cdot \frac{0,035}{12}}{\left(1 + \frac{0,035}{12}\right) \cdot \left[\left(1 + \frac{0,035}{12}\right)^{187} - 1\right]} \approx \underline{\underline{321,36 \text{ €}}}$$

2.