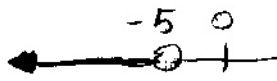
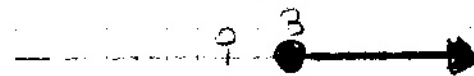
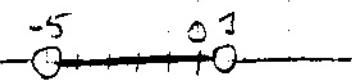


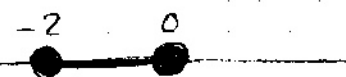
# BOL-T11 Ejercicio 1 (intervalos)

4 ESO

a)  $x < -5$   $(-\infty, -5)$  

b)  $3 \leq x$   $[3, +\infty)$  

c)  $-5 < x < 1$   $(-5, 1)$  

d)  $-2 \leq x \leq 0$   $[-2, 0]$  

## Ejercicio 1 (Radicales)

a)  $\sqrt{2} + \sqrt{8} + \sqrt{18} - \sqrt{32} = \sqrt{2} + \sqrt{2^3} + \sqrt{2 \cdot 3^2} - \sqrt{2^5} =$

$= \sqrt{2} + 2\sqrt{2} + 3\sqrt{2} - 2^2\sqrt{2} = (1 + 2 + 3 - 4)\sqrt{2} = 2\sqrt{2}$

b)  $\sqrt{5} + \sqrt{45} + \sqrt{180} - \sqrt{20} = \sqrt{5} + \sqrt{3^2 \cdot 5} + \sqrt{2^2 \cdot 3^2 \cdot 5} - \sqrt{2^2 \cdot 5} =$

$= \sqrt{5} + 3\sqrt{5} + 6\sqrt{5} - 2\sqrt{5} = (1 + 3 + 6 - 2)\sqrt{5} = 8\sqrt{5}$

c)  $\sqrt{24} - 5\sqrt{6} + \sqrt{486} = \sqrt{2^3 \cdot 3} - 5\sqrt{6} + \sqrt{2 \cdot 3^5} =$

$= 2\sqrt{2 \cdot 3} - 5\sqrt{6} + 3^2\sqrt{2 \cdot 3} = 2\sqrt{6} - 5\sqrt{6} + 9\sqrt{6} =$

$= (2 - 5 + 9)\sqrt{6} = 6\sqrt{6}$

d)  $\sqrt[3]{54} - 2\sqrt[3]{16} = \sqrt[3]{2 \cdot 3^3} - 2\sqrt[3]{2^4} = 3\sqrt[3]{2} - 2 \cdot 2\sqrt[3]{2} = -\sqrt[3]{2}$

e)  $27\sqrt{3} - 5\sqrt{27} - 9\sqrt{12} = 27\sqrt{3} - 5\sqrt{3^3} - 9\sqrt{2^2 \cdot 3} =$

$= 27\sqrt{3} - 5 \cdot 3\sqrt{3} - 9 \cdot 2\sqrt{3} = (27 - 15 - 18)\sqrt{3} = -6\sqrt{3}$

f)  $2\sqrt{8} + 5\sqrt{72} - 7\sqrt{18} - \sqrt{50} = 2\sqrt{2^3} + 5\sqrt{2^3 \cdot 3^2} - 7\sqrt{2 \cdot 3^2} - \sqrt{2 \cdot 5^2} =$

$= 2 \cdot 2\sqrt{2} + 5 \cdot 2 \cdot 3\sqrt{2} - 7 \cdot 3\sqrt{2} - 5\sqrt{2} = (4 + 30 - 21 - 5)\sqrt{2} = 8\sqrt{2}$

## Ejercicio 2 (Radicales)

a)  $\frac{1+\sqrt{2}}{1-\sqrt{3}} = \frac{1+\sqrt{2}}{1-\sqrt{3}} \cdot \frac{1+\sqrt{3}}{1+\sqrt{3}} = \frac{1+\sqrt{3}+\sqrt{2}+\sqrt{6}}{1-3} = -\frac{1+\sqrt{2}+\sqrt{3}+\sqrt{6}}{2}$

b)  $\frac{1}{4\sqrt{6}+12} = \frac{1}{4} \cdot \frac{1}{\sqrt{6}+3} = \frac{1}{4} \cdot \frac{1}{\sqrt{6}+3} \cdot \frac{\sqrt{6}-3}{\sqrt{6}-3} = \frac{1}{4} \cdot \frac{\sqrt{6}-3}{6-9} =$

$= -\frac{1}{12} \cdot (\sqrt{6}-3) = \frac{3-\sqrt{6}}{12}$

$$c) \frac{4}{\sqrt[3]{2}} = \frac{4}{\sqrt[3]{2}} \cdot \frac{\sqrt[3]{2^2}}{\sqrt[3]{2^2}} = \frac{4\sqrt[3]{4}}{2} = 2\sqrt[3]{4}$$

$$d) \frac{6}{\sqrt[5]{3^2}} = \frac{6}{\sqrt[5]{3^2}} \cdot \frac{\sqrt[5]{3^3}}{\sqrt[5]{3^3}} = \frac{6 \cdot \sqrt[5]{27}}{3} = 2\sqrt[5]{27}$$

$$e) \frac{3}{2\sqrt{8}} = \frac{3}{2\sqrt{2^3}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{3\sqrt{2}}{4}$$

$$f) \frac{3(\sqrt{7}+1)}{\sqrt{7}+2} = 3 \cdot \frac{\sqrt{7}+1}{\sqrt{7}+2} \cdot \frac{\sqrt{7}-2}{\sqrt{7}-2} = \frac{3 \cdot 7 - 2\sqrt{7} + \sqrt{7} - 2}{7-4} =$$

$$= \frac{3 \cdot 5 - \sqrt{7}}{3} = 5 - \frac{\sqrt{7}}{3}$$

$$g) \frac{\sqrt{3}+1}{\sqrt{3}-1} = \frac{\sqrt{3}+1}{\sqrt{3}-1} \cdot \frac{\sqrt{3}+1}{\sqrt{3}+1} = \frac{3+2\sqrt{3}+1}{3-1} = \frac{4+2\sqrt{3}}{2} = 2+\sqrt{3}$$

$$h) \frac{1+\sqrt{2}}{2-\sqrt{2}} = \frac{1+\sqrt{2}}{2-\sqrt{2}} \cdot \frac{2+\sqrt{2}}{2+\sqrt{2}} = \frac{2+\sqrt{2}+2\sqrt{2}+2}{4-2} = \frac{4+3\sqrt{2}}{2}$$

$$i) \frac{5-7\sqrt{3}}{1+\sqrt{3}} = \frac{5-7\sqrt{3}}{1+\sqrt{3}} \cdot \frac{1-\sqrt{3}}{1-\sqrt{3}} = \frac{5-5\sqrt{3}-7\sqrt{3}+7 \cdot 3}{1-3} = \frac{26-12\sqrt{3}}{-2} =$$

$$= -13+6\sqrt{3} = 6\sqrt{3}-13$$

$$j) \frac{7}{1-\sqrt{7}} = \frac{7}{1-\sqrt{7}} \cdot \frac{7+\sqrt{7}}{7+\sqrt{7}} = \frac{49+7\sqrt{7}}{49-7} = \frac{49+7\sqrt{7}}{42} = \frac{7+\sqrt{7}}{6}$$

### Ejercicio 1 (Logaritmos)

$$a) \log_2 0,125 = x \Leftrightarrow 2^x = 0,125 = \frac{125}{1000} = \frac{5^3}{2^3 \cdot 5^3} = \frac{1}{2^3} = 2^{-3}$$

$$2^x = 2^{-3} \Rightarrow x = -3$$

$$b) \log_4 \frac{3}{48} = x \Leftrightarrow 4^x = \frac{3}{48} = \frac{3}{2^4 \cdot 3} = \frac{1}{2^4} = 2^{-4} = 2^{2 \cdot (-2)} = 4^{-2}$$

$$4^x = 4^{-2} \Rightarrow x = -2$$

$$c) \log_{81} 3 = x \Leftrightarrow 81^x = 3 \Leftrightarrow 3^{4 \cdot x} = 3 \Rightarrow 4x = 1 \Rightarrow x = \frac{1}{4}$$

$$d) \log_{25} 5 = x \Leftrightarrow 25^x = 5 \Leftrightarrow 5^{2 \cdot x} = 5 \Rightarrow 2x = 1 \Rightarrow x = \frac{1}{2}$$

$$e) \log_{1000} 10 = x \Leftrightarrow 1000^x = 10 \Leftrightarrow 10^{3 \cdot x} = 10 \Rightarrow 3x = 1$$

$$\Rightarrow x = \frac{1}{3}$$

$$f) \log_{1000} 100 = x \Leftrightarrow 1000^x = 100 \Leftrightarrow 10^{3x} = 10^2 \Rightarrow 3x = 2 \Rightarrow x = \frac{2}{3}$$

BOLTA 2 Ejercicio 2 (Logaritmos)

4 ESO

$$\log(A) = 1, \log(B) = 0,5, \log(C) = 2$$

$$\begin{aligned} D &= \frac{A^5 \cdot \sqrt{B}}{C^4} \Rightarrow \log D = \log\left(\frac{A^5 \cdot \sqrt{B}}{C^4}\right) = \log(A^5 \cdot \sqrt{B}) - \log C^4 = \\ &= \log(A^5) + \log(\sqrt{B}) - 4 \log C = 5 \log A + \frac{1}{2} \log B - 4 \log C = \\ &= 5 \cdot 1 + \frac{1}{2} \cdot \frac{1}{2} - 4 \cdot 2 = 5 + \frac{1}{4} - 8 = -3 + \frac{1}{4} = -\frac{11}{4} \end{aligned}$$

$$\underline{\underline{\log D = -\frac{11}{4} = -2,75}}$$

$$\begin{aligned} E &= \sqrt{\frac{A}{B \cdot \sqrt{C}}} \Rightarrow \log E = \log\left(\sqrt{\frac{A}{B \cdot \sqrt{C}}}\right) = \frac{1}{2} \log\left(\frac{A}{B \sqrt{C}}\right) = \\ &= \frac{1}{2} [\log A - \log(B \cdot \sqrt{C})] = \frac{1}{2} [\log A - \log B - \log \sqrt{C}] = \\ &= \frac{1}{2} [\log A - \log B - \frac{1}{2} \log C] = \frac{1}{2} [1 - 0,5 - \frac{1}{2} \cdot 2] = \\ &= \frac{0,5}{2} = 0,25 \Rightarrow \underline{\underline{\log E = 0,25 = \frac{1}{4}}} \end{aligned}$$

$$\begin{aligned} F &= \sqrt[3]{\frac{A^2}{B \sqrt{C}}} \Rightarrow \log F = \log \sqrt[3]{\frac{A^2}{B \sqrt{C}}} = \frac{1}{3} \log \frac{A^2}{B \sqrt{C}} = \\ &= \frac{1}{3} [\log A^2 - \log B \sqrt{C}] = \frac{1}{3} [2 \cdot \log A - \log B - \log \sqrt{C}] = \\ &= \frac{1}{3} [2 \cdot \log A - \log B - \frac{1}{2} \log C] = \frac{1}{3} [2 \cdot 1 - 0,5 - \frac{1}{2} \cdot 2] = \\ &= \frac{1}{3} \cdot 0,5 = \frac{1}{3} \cdot \frac{1}{2} = \frac{1}{6} = 0,16 \Rightarrow \underline{\underline{\log F = \frac{1}{6} = 0,16}} \end{aligned}$$