

# Solución al problema de “Valor de la expresión”

Enunciado:

The image shows the cover of a mathematics book. The title 'EXPRESSÃO NUMÉRICA' is at the top in large, bold, black letters. Below it, the subtitle 'Qual o valor da expressão?' is written in a larger, bold, blue font. The background of the cover is white with some abstract yellow and orange brushstrokes.

$$\frac{\sqrt{3} + 1}{\sqrt{3} - 1} + \frac{\sqrt{3} - 1}{\sqrt{3} + 1}$$

Solución:

Calculemos primero el primer sumando (racionalicemos):

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

A photograph of a Casio Classwiz calculator screen. The display shows the expression  $\frac{\sqrt{3}+1}{\sqrt{3}-1}$  above a result area, and  $2+\sqrt{3}$  below it, indicating the simplified form.

Véase con la Casio Classwiz:

Calculemos ahora el segundo sumando: no es más que el inverso del anterior, por tanto:

$$\frac{\sqrt{3} - 1}{\sqrt{3} + 1} = \frac{1}{2 + \sqrt{3}}$$

Finalmente, la suma de ambos queda:  $2 + \sqrt{3} + \frac{1}{2 + \sqrt{3}} = \frac{(2 + \sqrt{3})^2 + 1}{2 + \sqrt{3}} = \frac{7 + 4\sqrt{3} + 1}{2 + \sqrt{3}} = \frac{8 + 4\sqrt{3}}{2 + \sqrt{3}} = \frac{4 \cdot (2 + \sqrt{3})}{2 + \sqrt{3}} = 4$

Solución: 4