

## PROBLEMAS DE EXPRESIONES ALGEBRAICAS Y OPERACIONES

Problema 32:

Resolver

$$A) \sqrt{45c^3} - \sqrt{80c^3} + \sqrt{5a^2c}$$

$$B) \sqrt{18a^3b^3c^4 + 9a^2b^2c^4}$$

$$C) \sqrt{\frac{a^4c}{b^3}} + \sqrt{\frac{a^2c^3}{bd^2}} - \sqrt{\frac{a^2cd^2}{bc^2}}$$

$$D) \sqrt{\frac{a^2x - 2ax^2 + x^3}{a^2 + 2ax^2 + x^2}}$$

$$E) \sqrt{\frac{a}{a^2bd - 2ab^2d + b^3d}}$$

$$F) \sqrt{\frac{a^3 - ax^2 - a^2x + x^3}{b^5c^3d}}$$

Solución Problema 32:

$$A) \sqrt{45c^3} - \sqrt{80c^3} + \sqrt{5a^2c} = \sqrt{3^2x5xc^3} - \sqrt{2^4x5xc^3} + \sqrt{5xa^2xc}$$

$$3c\sqrt{5xc} - 4c\sqrt{5xc} + a\sqrt{5xc} = -c\sqrt{5xc} + a\sqrt{5xc} = \sqrt{5c}(a - c)$$

$$B) \sqrt{18a^3b^3c^4 + 9a^2b^2c^4} = \sqrt{9a^2b^2c^4(2ab + 1)} = 3abc^2\sqrt{(2ab + 1)}$$

$$C) \sqrt{\frac{a^4c}{b^3}} + \sqrt{\frac{a^2c^3}{bd^2}} - \sqrt{\frac{a^2cd^2}{bc^2}} = \sqrt{\frac{a^2a^2c}{b^2b}} + \sqrt{\frac{a^2c^2c}{bd^2}} - \sqrt{\frac{a^2cd^2}{bc^2}}$$

$$\frac{a^2}{b} \sqrt{\frac{c}{b}} + \frac{ac}{d} \sqrt{\frac{c}{b}} - \frac{ad}{c} \sqrt{\frac{c}{b}} = \sqrt{\frac{c}{b}} \left( \frac{a^2}{b} + \frac{ac}{d} - \frac{ad}{c} \right)$$

$$\sqrt{\frac{c}{b}} \left( \frac{a^2}{b} + \frac{ac}{d} - \frac{ad}{c} \right) = \frac{\sqrt{cb}}{b} \left( \frac{a^2}{b} + \frac{ac}{d} - \frac{ad}{c} \right)$$

$$D) \sqrt{\frac{a^2x-2ax^2+x^3}{a^2+2ax^2+x^2}} = \sqrt{\frac{a^2x-2ax^2+x^3}{(a+x)^2}} = \frac{1}{a+x} \sqrt{a^2x-2ax^2+x^3}$$

$$\frac{1}{a+x} \sqrt{x(a^2-2ax+x^2)} = \frac{1}{a+x} \sqrt{x(a-x)^2} = \frac{a-x}{a+x} \sqrt{x}$$

$$E) \sqrt{\frac{a}{a^2bd-2ab^2d+b^3d}} = \sqrt{\frac{a}{bd(a^2-2ab+b^2)}} = \sqrt{\frac{a}{bd(a-b)^2}}$$

$$\frac{1}{a-b} \sqrt{\frac{a}{bd}}$$

$$F) \sqrt{\frac{a^3-ax^2-a^2x+x^3}{b^5c^3d}} = \frac{1}{b^2c} \sqrt{\frac{a^3-ax^2-a^2x+x^3}{bcd}}$$

$$\frac{1}{b^2c} \sqrt{\frac{(a-x)(a^2-x^2)}{bcd}} = \frac{1}{b^2c} \sqrt{\frac{(a-x)(a-x)(a+x)}{bcd}}$$

$$\frac{1}{b^2c} \sqrt{\frac{(a-x)^2(a+x)}{bcd}} = \frac{(a-x)}{b^2c} \sqrt{\frac{(a+x)}{bcd}}$$

La igualdad

$$a^3-ax^2-a^2x+x^3 = (a-x)(a^2-x^2)$$

se resuelve mediante la aplicación de la regla de Ruffini:

$$\begin{array}{r} 1 - x - x^2 + x^3 \\ x \quad x \quad 0 \quad -x^3 \\ \hline \end{array}$$

$$\frac{1 - 0 - x^2}{(a - x)(a^2 - x^2)}$$