

### EJERCICIO MIBE2311:

$$\sqrt[3]{6^{3x+2}} \cdot \sqrt{6^{1-x}} \cdot \sqrt[5]{6^{x^2+3}} = \sqrt[4]{6^x}$$

DE DOS MANERAS:

a) CON LAS RAÍCES (INDICES COMÚN):  
i.m.c.m. (3, 2, 5, 4) = 60!

$$\sqrt[60]{6^{60x+40}} \cdot \sqrt[60]{6^{30-30x}} \cdot \sqrt[60]{6^{12x^2+36}} = \sqrt[60]{6^{15x}}$$

$$\sqrt[60]{6^{12x^2+30x+106}} = \sqrt[60]{6^{15x}}$$

$$12x^2 + 30x + 106 = 15x$$

$$12x^2 + 15x + 106 = 0$$

$$x = \frac{-15 \pm \sqrt{15^2 - 4 \cdot 12 \cdot 106}}{2 \cdot 12} = \frac{-15 \pm \sqrt{-4863}}{24}$$

¡NO  
SOLUCIONES  
REALES!

$$x_1 = \frac{-15 + \sqrt{4863}}{24} i$$

$$x_2 = \frac{-15 - \sqrt{4863}}{24} i$$

b) UTILIZANDO EXPONENTES FRACCIONARIOS:

$$(6^{3x+2})^{1/3} \cdot (6^{1-x})^{1/2} \cdot (6^{x^2+3})^{1/5} = (6^x)^{1/4}$$

$$6^{\frac{3x+2}{3}} \cdot 6^{\frac{1-x}{2}} \cdot 6^{\frac{x^2+3}{5}} = 6^{\frac{x}{4}}$$

$$6^{\frac{3x+2}{3} + \frac{1-x}{2} + \frac{x^2+3}{5}} = 6^{\frac{x}{4}}$$

$$\frac{3x+2}{3} + \frac{1-x}{2} + \frac{x^2+3}{5} = \frac{x}{4}$$

$$\frac{30x+20+15-15x+6x^2+18}{30} = \frac{x}{4}$$

$$4 \cdot (30x+20+15-15x+6x^2+18) = 30x$$

$$4(6x^2+15x+53) = 30x$$

$$24x^2 + 60x + 212 = 30x$$

$$24x^2 + 30x + 212 = 0$$

$$12x^2 + 15x + 106 = 0$$

$$x = \frac{-15 \pm \sqrt{15^2 - 4 \cdot 12 \cdot 106}}{2 \cdot 12} = \frac{-15 \pm \sqrt{-4863}}{24}$$

*¡ No  
SOLUCIONES  
REALES!*

$$x_1 = \frac{-15 + \sqrt{4863}}{24} i$$

$$x_2 = \frac{-15 - \sqrt{4863}}{24} i$$