

Solución modulo - Pág 34

3. Realizar las siguientes operaciones

$$a) \frac{161y^3 x^2 y}{23y^6 x^2} = \frac{161y^3 y}{23y^6}$$

$$\frac{7y^3 y}{y^6} = \frac{7y}{y^3} = \frac{7}{y^2}$$

$$b) \frac{11x^{-2} y^{-10} x^{12}}{2x^3 4x^5} = \frac{11x^{-2} y^{-10} x^9}{2 \cdot 4x^5} =$$

$$\frac{11y^{-10} x^{9-2}}{2 \cdot 4x^7} = \frac{11y^{-10} x^7}{2 \cdot 4y^{10}}$$

$$= \frac{11x^7}{8y^{10}}$$

$$\begin{aligned}
 c) \quad \frac{14x^9 y^8 x^{32} z}{7x^{-10} x^{-9} y} &= \frac{2x^4 y^8 x^{32} z}{x^{-10} x^{-9} y} = \\
 \frac{2x^{14} y^8 x^{32} z}{x^{-9} y} &= \frac{2x^{14} y^7 x^{32} z}{x^{-9}} = \\
 = 2x^{14} y^7 x^{41} z &= 2x^{55} y^7 z
 \end{aligned}$$

2. Realizar las siguientes operaciones

$$a) \sqrt[5]{5} \cdot \sqrt[5]{6} \cdot \sqrt[5]{10} \cdot \sqrt[5]{8} =$$

$$\sqrt[5]{5 \times 6 \times 10 \times 8} = \sqrt[5]{2400}$$

$$\sqrt[5]{2^5 \cdot 75} = \sqrt[5]{2^5} \cdot \sqrt[5]{75} = 2 \sqrt[5]{75}$$

$$= 2 \sqrt[5]{75}$$

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$$b) \sqrt[3]{2} \cdot \sqrt[3]{5} \cdot \sqrt[3]{6} =$$

$$\sqrt[3]{2 \cdot 5 \cdot 6} = \sqrt[3]{60}$$

$$c) \sqrt[4]{16} \cdot \sqrt[4]{9} \cdot \sqrt[4]{11} = \sqrt[4]{16} = \sqrt[4]{2^4}$$

$$2 \sqrt[4]{9} \sqrt[4]{11} = \sqrt[4]{9 \cdot 11} = \sqrt[4]{99}$$

$$d) \frac{\sqrt[3]{27}}{\sqrt[3]{3}} = \frac{\sqrt[3]{3} \sqrt[3]{9}}{\sqrt[3]{3}} = \sqrt[3]{9} = \sqrt{3^2} = 3$$

$$e) \frac{\sqrt[5]{160}}{\sqrt[5]{5}} = \frac{\sqrt[5]{5} \sqrt[5]{32}}{\sqrt[5]{5}} = \sqrt[5]{32}$$

$$\sqrt[5]{2^5} = 2$$

$$F) \frac{\sqrt[3]{24}}{\sqrt[3]{3}} = \frac{\sqrt[3]{\cancel{3}} \sqrt[3]{8}}{\sqrt[3]{\cancel{3}}} \quad \sqrt[3]{8}$$

$$\sqrt[3]{2^3} = 2$$

$$G) \sqrt[4]{9} \cdot \sqrt[4]{2} \cdot \sqrt[4]{15} \cdot \sqrt[4]{8} =$$

$$\sqrt[4]{9 \cdot 2 \cdot 15 \cdot 8} = \sqrt[4]{2160} = \sqrt[4]{2^4 \cdot 135}$$

$$\sqrt[4]{2^4} \sqrt[4]{135} = 2 \sqrt[4]{135}$$

$$H) \sqrt[3]{\frac{12}{3}} \cdot \sqrt[3]{\frac{5}{2}} \cdot \sqrt[3]{15} \cdot \sqrt[3]{\frac{8}{7}}$$

$$\sqrt[3]{\frac{\cancel{12}}{3} \cdot \frac{5}{2} \cdot 15 \cdot \frac{8}{7}}$$

$$\sqrt[3]{4 \cdot \frac{5}{\cancel{2}} \cdot 15 \cdot \frac{\cancel{8}}{7}}$$

$$\sqrt[3]{4 \cdot 5 \cdot 15 \cdot \frac{4}{7}}$$

$$\frac{4 \times 5 \times 15 \times 4}{1 \times 1 \times 1 \times 7} = \frac{1200}{1117} = \frac{1200}{7}$$

$$\sqrt[3]{\frac{1200}{7}} = \frac{\sqrt[3]{1200}}{\sqrt[3]{7}} = \frac{\sqrt[3]{2^3 \cdot 150}}{\sqrt[3]{7}}$$

$$\sqrt[3]{2^3} \sqrt[3]{150} = \frac{2\sqrt[3]{150}}{\sqrt[3]{7}} \times \frac{\sqrt[3]{7^2}}{\sqrt[3]{7^2}}$$

$$\frac{2\sqrt[3]{150} \sqrt[3]{7^2}}{\sqrt[3]{7} \sqrt[3]{7^2}} = \frac{2\sqrt[3]{150 \cdot 7^2}}{\sqrt[3]{7 \cdot 7^2}}$$

$$\frac{2\sqrt[3]{150 \cdot 7^2}}{\sqrt[3]{7^3}} = \frac{2\sqrt[3]{150 \cdot 7^2}}{7} = \frac{2\sqrt[3]{150 \cdot 49}}{7}$$

$$= \frac{2\sqrt[3]{7350}}{7}$$

$$I) \sqrt[6]{19} \cdot \sqrt[6]{5} \cdot \sqrt[6]{11} \cdot \sqrt[4]{2}$$

$$\sqrt[6]{19 \times 5 \times 11 \times 2} = \sqrt[6]{2090}$$

$$J) \sqrt[19]{\frac{3}{2}} \quad \sqrt[10]{\frac{4}{5}} \quad \sqrt[9]{\frac{1}{3}} \quad \sqrt[10]{\frac{6}{7}}$$

$$\sqrt[180]{\left(\frac{3}{2}\right)^{18}} \quad \sqrt[10]{\frac{4}{5}} \quad \sqrt[26]{\frac{1}{3}} \quad \sqrt[3]{\frac{6}{7}}$$

$$\sqrt[180]{\left(\frac{3}{2}\right)^{18}}$$

$$\sqrt[180]{\left(\frac{4}{5}\right)^{18}}$$

$$\sqrt[180]{\left(\frac{1}{3}\right)^5}$$

$$\sqrt[180]{\left(\frac{6}{7}\right)^{60}}$$

$$\sqrt[180]{\left(\frac{3}{2}\right)^{18} \times \left(\frac{4}{5}\right)^{18} \times \left(\frac{1}{3}\right)^5 \times \left(\frac{6}{7}\right)^{60}}$$

$$\sqrt[180]{\frac{3^{18}}{2^{18}} \times \frac{4^{18}}{5^{18}} \times \frac{1^5}{3^5} \times \frac{6^{60}}{7^{60}}}$$

$$\sqrt[180]{\frac{3^{18}}{2^{18}} \times \frac{2^{36}}{5^{18}} \times \frac{1}{243} \times \frac{6^{60}}{7^{60}}}$$

$$\sqrt[180]{\frac{3^{18}}{2^{18}} \times \frac{2^{36}}{5^{18}} \times \frac{1}{3^5} \times \frac{6^{60}}{7^{60}}}$$

$$\sqrt[180]{\frac{3^{13}}{2^{18}} \times \frac{2^{36}}{5^{18}} \times \frac{6^{60}}{7^{60}}} = \sqrt[180]{3^{13} \times \frac{2^{18}}{5^{18}} \times \frac{6^{60}}{7^{60}}}$$

$$\sqrt{\frac{3^{13} \times 2^{18} \times 6^{60}}{5^{18} \times 7^{60}}}$$

$$\sqrt[180]{3^{13} \times (2^{18} \times 6^{60})^{179}}$$

$$\sqrt[180]{5^{18} \times 7^{60}}$$

$$\sqrt{\frac{3^{13} \times 2^{18} \times 6^{60} \times 5^{3222} \times 7^{10740}}{5^{18} \times 7^{60}}}$$

$$\sqrt[180]{\frac{3^{13} \times 2^{18} \times 6^{60} \times 5^{162} \times 7^{120}}{5 \times 7}}$$

$$\sqrt[180]{\frac{3^{13} \times 2^{18} \times 6^{60} \times 5^{162} \times 7^{120}}{35}}$$

$$k) \frac{\sqrt[4]{9}}{\sqrt[4]{2}} \cdot \frac{\sqrt[4]{15}}{\sqrt[4]{8}} = \frac{\sqrt[4]{135}}{\sqrt[4]{16}}$$

$$\frac{\sqrt[4]{135}}{\sqrt[4]{2}}$$

$$l) \frac{\cancel{\sqrt[4]{9}}}{\cancel{\sqrt[4]{3}}} = \sqrt[4]{3}$$

$$m) \frac{\sqrt[3]{10}}{\cancel{\sqrt[3]{15}}} \cdot \frac{\cancel{\sqrt[3]{15}}}{\sqrt[3]{8}} = \sqrt[3]{10} \times \frac{1}{\sqrt[3]{8}}$$

$$\sqrt[3]{5} \times \frac{1}{\sqrt[3]{4}} = \frac{\sqrt[3]{5}}{\sqrt[3]{4}}$$

$$\frac{\sqrt[5]{5 \times 2^3}}{2} = \frac{\sqrt[5]{5 \times 8}}{2} = \frac{\sqrt[5]{40}}{2}$$

$$N) \frac{\sqrt[4]{18}}{\sqrt[4]{6}} \cdot \sqrt[4]{5} \cdot \sqrt[4]{18} =$$

$$\frac{\sqrt[4]{18}}{\sqrt[4]{6}} = \frac{\sqrt[4]{6} \sqrt[4]{3}}{\sqrt[4]{6}} = \sqrt[4]{3} \cdot \sqrt[4]{5} \cdot \sqrt[4]{18}$$

$$= \sqrt[4]{270}$$