

NOMBRE:

NOTA:

1. (1,5 puntos cada apartado) Simplifica las siguientes expresiones y da el resultado en forma de potencia de exponente positivo.

$$\begin{aligned} \text{a) } (\sqrt[6]{z^4} \cdot \sqrt[5]{z^7}) : (z \cdot \sqrt[3]{z^2}) &= (2^{\frac{4}{6}} \cdot 2^{\frac{7}{5}}) : (2 \cdot 2^{\frac{2}{3}}) = \left(2^{\frac{20+42}{30}}\right) : \left(2^{\frac{5}{3}}\right) = \\ &= 2^{\frac{62}{30} - \frac{5}{3}} = 2^{\frac{12}{30}} = 2^{\frac{2}{5}} \end{aligned}$$

$$\begin{aligned} \text{b) } \sqrt{2\sqrt[3]{16}\sqrt[4]{8}} &= \sqrt{2 \cdot \sqrt[6]{16} \cdot \sqrt[24]{8}} = 2^{\frac{1}{2}} \cdot 2^{\frac{4}{6}} \cdot 2^{\frac{3}{24}} = 2^{\frac{12+16+3}{24}} = \\ &= 2^{\frac{31}{24}} \end{aligned}$$

2. (1 punto cada apartado) Racionaliza y simplifica.

$$\text{a) } \frac{1}{\sqrt[7]{b^2}} = \frac{1}{\sqrt[7]{b^2}} \cdot \frac{\sqrt[7]{b^5}}{\sqrt[7]{b^5}} = \frac{\sqrt[7]{b^5}}{b}$$

$$\begin{aligned} \text{b) } \frac{2\sqrt{3}+\sqrt{2}}{3\sqrt{12}} &= \frac{2\sqrt{3}+\sqrt{2}}{3\sqrt{2^2 \cdot 3}} = \frac{2\sqrt{3}+\sqrt{2}}{6\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{(2\sqrt{3}+\sqrt{2})\sqrt{3}}{6(\sqrt{3})^2} = \\ &= \frac{2\sqrt{3}\sqrt{3}+\sqrt{2}\sqrt{3}}{6 \cdot 3} = \frac{2 \cdot 3 + \sqrt{6}}{18} = \frac{6+\sqrt{6}}{18} = \frac{1}{3} + \frac{\sqrt{6}}{18} \end{aligned}$$

$$\begin{aligned} \text{c) } \frac{10}{\sqrt{7}-\sqrt{3}} &= \frac{10}{\sqrt{7}-\sqrt{3}} \cdot \frac{\sqrt{7}+\sqrt{3}}{\sqrt{7}+\sqrt{3}} = \frac{10(\sqrt{7}+\sqrt{3})}{(\sqrt{7})^2 - (\sqrt{3})^2} = \\ &= \frac{10(\sqrt{7}+\sqrt{3})}{7-3} = \frac{10(\sqrt{7}+\sqrt{3})}{4} = \frac{5(\sqrt{7}+\sqrt{3})}{2} \end{aligned}$$

3. (1,5 puntos cada apartado) Opera y simplifica.

$$\begin{aligned} \text{a) } 2\sqrt{180} + \frac{3}{5}\sqrt{125} + \sqrt{5} &= 2\sqrt{2^2 \cdot 3^2 \cdot 5} + \frac{3}{5}\sqrt{5^3} + \sqrt{5} = \\ &= 2 \cdot 2 \cdot 3 \cdot \sqrt{5} + \frac{3}{5} \cdot 5\sqrt{5} + \sqrt{5} = 12\sqrt{5} + 3\sqrt{5} + \sqrt{5} = \\ &= 16\sqrt{5} \end{aligned}$$

$$\text{b) } (\sqrt{2}-1)(\sqrt{2}+1)\sqrt{3} = [(\sqrt{2})^2 - 1^2]\sqrt{3} = (2-1)\sqrt{3} = \sqrt{3}$$

4. (1 punto) Simplifica aplicando identidades notables.

$$\begin{aligned} 2(3-2\sqrt{2})^2 &= 2 \cdot (3^2 + (2\sqrt{2})^2 - 2 \cdot 3 \cdot 2\sqrt{2}) = \\ &= 2 \cdot (9 + 4 \cdot 2 - 12\sqrt{2}) = 2(9 + 8 - 12\sqrt{2}) = \\ &= 2(17 - 12\sqrt{2}) = 34 - 24\sqrt{2} \end{aligned}$$