

<b>Examen de Matemáticas Ciencias Sociales I – 1º de Bachillerato</b>
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1. Calcula: (1,5 puntos)

a)  $[7 \cdot 2 - 3 + 4] \div 2 \cdot 3 + [6 - (-4)]^2 + 5$  ; b)  $(4 - 7 - (-5) + 3)^2 + 5 \cdot (-5) \div 5 - 30$

c)  $24 - [(-3) + 5]^3 - [4^2 \div (5 - (-3))]^2$

2. Realiza las siguientes operaciones: (2 puntos)

a)  $\left[ \frac{1}{3} + \frac{1}{2} \left( \frac{1}{2} - \frac{1}{4} \right) + 5 \right] - 3 \cdot \left[ 4 \div \left( \frac{3}{5} + 1 \right) \right]$  ; b)  $\frac{\frac{3}{5} - \frac{1}{4}}{1 - \frac{1}{2} + \frac{4}{3}} - 2 \cdot \frac{4}{5} + \left( \frac{1}{2} \right)^{-1}$

3. Simplifica al máximo los radicales siguientes extrayendo factores: (1,5 puntos)

a)  $\sqrt{216x^6y^8z^2}$  ; b)  $\sqrt[3]{\frac{64x^9}{125y^7}}$  ; c)  $\sqrt[4]{162a^9b^{17}}$

4. Efectúa las operaciones indicadas reduciendo a índice común si fuera preciso y simplifica al máximo el resultado: (1 punto)

a)  $\frac{\sqrt{x^5}}{\sqrt[5]{x^4}}$  ; b)  $\sqrt[4]{\frac{\sqrt[3]{x^6}}{y}} \cdot \sqrt{\frac{\sqrt[3]{y^2}}{\sqrt[3]{x^2}}}$

5. Efectúa y simplifica, extrayendo el mayor número de factores posible: (1 punto)

a)  $\frac{\sqrt{5x^7y^5} \cdot \sqrt{3x^6y^3}}{\sqrt{3x^3y^2}}$  ; b)  $(\sqrt{3} - 4\sqrt{48}) \cdot (\sqrt{12} - 3\sqrt{3})$

6. Racionaliza las siguientes expresiones y simplifica el resultado: (1 punto)

a)  $\frac{\sqrt{x}}{\sqrt[3]{x}}$  ; b)  $\frac{\sqrt{3} - 2\sqrt{2}}{\sqrt{3} - \sqrt{2}}$

7. Resuelve las siguientes ecuaciones: (2 puntos)

a)  $\frac{2x-4}{5} - \frac{20-x}{4} - 6 = \frac{1}{6} - \frac{x+\frac{1}{2}}{3}$  ; b)  $\frac{5}{6} \cdot \left( x - \frac{1}{3} \right) + \frac{7}{6} \cdot \left( \frac{x}{5} - \frac{1}{7} \right) = 4 + \frac{8}{9}$

$$\textcircled{1} \text{ a) } [7 \cdot 2 - 3 + 4 : 2] \cdot 3 + [6 - (-4)]^2 + 5 = (14 - 3 + 2) \cdot 3 + 10^2 + 5 =$$

$$= 13 \cdot 3 + 100 + 5 = 39 + 100 + 5 = \underline{144}.$$

$$\text{b) } (4 - 7 - (-5) + 3)^2 + 5 \cdot (-5) : 5 - 30 = 5^2 - 25 : 5 - 30 =$$

$$= 25 - 5 - 30 = \underline{-10}.$$

$$\text{c) } 24 - [(-3) + 5]^3 - [4^2 : (5 - (-3))]^2 = 24 - 2^3 - (16 : 8)^2 =$$

$$= 24 - 8 - 4 = \underline{12}.$$

$$\textcircled{2} \text{ a) } \left[ \frac{1}{3} + \frac{1}{2} \left( \frac{1}{2} - \frac{1}{4} \right) + 5 \right] - 3 \cdot \left[ 4 : \left( \frac{3}{5} + 1 \right) \right] =$$

$$= \left( \frac{1}{3} + \frac{1}{2} \cdot \frac{1}{4} + 5 \right) - 3 \cdot \left( 4 : \frac{8}{5} \right) = \left( \frac{1}{3} + \frac{1}{8} + 5 \right) - 3 \cdot \frac{20}{8} =$$

$$= \frac{8}{24} + \frac{3}{24} + \frac{120}{24} - \frac{60}{8} = \frac{131}{24} - \frac{15}{2} =$$

$$= \frac{131}{24} - \frac{180}{24} = \underline{-\frac{49}{24}}.$$

$$\text{b) } \frac{\frac{3}{5} - \frac{1}{4}}{1 - \frac{1}{2} + \frac{4}{3}} - 2 \cdot \frac{4}{5} + \left( \frac{1}{2} \right)^{-1} = \frac{\frac{12}{20} - \frac{5}{20}}{\frac{6}{6} - \frac{3}{6} + \frac{8}{6}} - \frac{8}{5} + 2 =$$

$$= \frac{\frac{7}{20}}{\frac{11}{6}} - \frac{8}{5} + 2 = \frac{42}{220} - \frac{8}{5} + 2 =$$

$$= \frac{42}{220} - \frac{352}{220} + \frac{440}{220} = \frac{130}{220} = \underline{\frac{13}{22}}.$$

$$\textcircled{3} \text{ a) } \sqrt{216 x^6 y^8 z^2} = \sqrt{2^3 \cdot 3^3 \cdot x^6 y^8 z^2} = 2 \cdot 3 x^3 y^4 z \sqrt{2 \cdot 3} =$$

$$= \underline{6 x^3 y^4 z \sqrt{6}}$$

$$\text{b) } \sqrt[3]{\frac{64 x^9}{125 y^7}} = \sqrt[3]{\frac{2^6 x^9}{5^3 y^7}} = \frac{2^2 x^3}{5 y^2} \sqrt[3]{\frac{1}{y}} = \underline{\underline{\frac{4 x^3}{5 y^2} \sqrt[3]{\frac{1}{y}}}}$$

$$\text{c) } \sqrt[4]{162 a^9 b^{17}} = \sqrt[4]{2 \cdot 3^4 \cdot a^9 b^{17}} = \underline{\underline{3 a^2 b^4 \sqrt[4]{2 a b}}}$$

$$\textcircled{4} \text{ a) } \frac{\sqrt{x^5}}{\sqrt[5]{x^4}} = \frac{\sqrt[10]{x^{25}}}{\sqrt[10]{x^8}} = \sqrt[10]{x^{17}} = \underline{\underline{x \sqrt[10]{x^7}}}$$

$$\text{b) } \sqrt[4]{\frac{\sqrt[3]{x^6}}{y}} \cdot \sqrt{\frac{\sqrt[3]{y^2}}{\sqrt[3]{x^2}}} = \sqrt[4]{\frac{x^2}{y}} \cdot \sqrt{\frac{\sqrt[3]{y^2}}{\sqrt[3]{x^2}}} = \sqrt[4]{\frac{x^2}{y}} \sqrt[6]{\frac{y^2}{x^2}} =$$

$$= \sqrt[12]{\frac{x^6}{y^3}} \sqrt[12]{\frac{y^4}{x^4}} = \sqrt[12]{\frac{x^6 y^4}{y^3 x^4}} = \underline{\underline{\sqrt[12]{x^2 y}}}$$

$$\textcircled{5} \text{ a) } \frac{\sqrt{5x^7y^5} \sqrt{3x^6y^3}}{\sqrt{3x^3y^2}} = \frac{\sqrt{15x^{13}y^8}}{\sqrt{3x^3y^2}} = \sqrt{\frac{15x^{13}y^8}{3x^3y^2}} =$$

$$= \sqrt{5x^{10}y^6} = \underline{\underline{x^5y^3\sqrt{5}}}$$

$$\text{b) } (\sqrt{3} - 4\sqrt{48})(\sqrt{12} - 3\sqrt{3}) = \sqrt{36} - 3\sqrt{9} - 4\sqrt{576} +$$

$$+ 12\sqrt{144} = 6 - 3 \cdot 3 - 4 \cdot 24 + 12 \cdot 12 =$$

$$= 6 - 9 - 96 + 144 = \underline{\underline{45}}$$

$$\textcircled{6} \text{ a) } \frac{\sqrt{x}}{\sqrt[3]{x}} = \frac{\sqrt{x} \sqrt{x^2}}{\sqrt{x} \sqrt{x^2}} = \frac{\sqrt[6]{x^3} \sqrt[6]{x^4}}{x} = \frac{\sqrt[6]{x^7}}{x} = \frac{x \sqrt[6]{x}}{x} = \underline{\underline{\sqrt[6]{x}}}$$

$$\text{b) } \frac{\sqrt{3} - 2\sqrt{2}}{\sqrt{3} - \sqrt{2}} = \frac{(\sqrt{3} - 2\sqrt{2})(\sqrt{3} + \sqrt{2})}{(\sqrt{3} - \sqrt{2})(\sqrt{3} + \sqrt{2})} = \frac{3 + \sqrt{6} - 2\sqrt{6} - 4}{(\sqrt{3})^2 - (\sqrt{2})^2} =$$

$$= \frac{-1 - \sqrt{6}}{3 - 2} = \frac{-1 - \sqrt{6}}{1} = \underline{\underline{-1 - \sqrt{6}}}$$

$$\textcircled{7} \text{ a) } \frac{2x-4}{5} - \frac{20-x}{4} - 6 = \frac{1}{6} - \frac{x + \frac{1}{2}}{3} ;$$

$$\frac{24x-48}{60} - \frac{300-15x}{60} - \frac{360}{60} = \frac{10}{60} - \frac{20x+10}{60} ;$$

$$24x - 48 - 300 + 15x - 360 = 10 - 20x - 10 ;$$

$$39x - 708 = -20x \Rightarrow 59x = 708 \Rightarrow x = \frac{708}{59} \Rightarrow \underline{\underline{x=12}}$$

$$\text{b) } \frac{5}{6} \left( x - \frac{1}{3} \right) + \frac{7}{6} \left( \frac{x}{5} - \frac{1}{7} \right) = 4 + \frac{8}{9} ;$$

$$\frac{5}{6} \left( \frac{3x-1}{3} \right) + \frac{7}{6} \left( \frac{7x-5}{35} \right) = \frac{36+8}{9} ;$$

$$\frac{15x-5}{18} + \frac{49x-35}{210} = \frac{44}{9} ;$$

$$\frac{35(15x-5)}{630} + \frac{3(49x-35)}{630} = \frac{3080}{630} ;$$

$$525x - 175 + 147x - 105 = 3080 ;$$

$$672x = 3360 ;$$

$$x = \frac{3360}{672} ;$$

$$\underline{\underline{x=5}}$$