

ASIGNATURA

MATEMÁTICA

EJERCICIO N°15:

a. $\frac{3s^3}{t^6}$

b. $\frac{9z^6}{y^2}$

EJERCICIO N°16:

a) $17y^7$

b) a^3

c) $\frac{x^2}{y}$

d) $\frac{64a^7b^3}{c^2}$

e) $648y^7$

f) $\frac{1}{a^4c^6}$

g) $\frac{y^2z^9}{x^5}$

EJERCICIO N°17:

a) $\frac{10}{x}$

b) $\frac{1}{4x^4}$

c) $-2x^3$

d) 3^{3n}

e) 1

EJERCICIO N°18:

Notación Decimal	Notación Científica
0.00002835	$2,835 \times 10^{-5}$
0,00000000999	9.99×10^{-9}
710000	7.1×10^5
7 200 000 000 000	$7,2 \times 10^{12}$
0,000006257	6.257×10^{-6}

EJERCICIO N°19:

a) 4×10^{-13}

b) $5,3 \times 10^{-23}$

c) $5,97 \times 10^{24}$

EJERCICIO N°20:

- a) $(7.2 \times 10^{-9})(1.8 \times 10^{-12}) = (7,2 \cdot 1,8) \times (10^{-9} \cdot 10^{-12}) = 12,96 \times 10^{-21} = 1,296 \times 10^{-20}$
- b) $\frac{1.2956 \times 10^9}{(3.6 \times 10^{-17})(2.511 \times 10^6)} = \frac{1.2956 \times 10^9}{9,0396 \times 10^{-11}} = \frac{1,2956}{9,0396} \times \frac{10^9}{10^{-11}} = 0,14332492588 \times 10^{20} = 1,4332492588 \times 10^{19}$
- c) $\frac{(0.0000162)(0.01582)}{(594\,621\,000)(0.0058)} = \frac{(1,62 \times 10^{-5}) \cdot (1,582 \times 10^{-2})}{(5,94621 \times 10^8) \cdot (5,8 \times 10^{-3})} = \frac{2,56284 \times 10^{-7}}{3,4488018 \times 10^6} = 7,4311025934 \times 10^{-14}$
- d) $\frac{(3.542 \times 10^{-6})^9}{(5.05 \times 10^4)^{12}} = 0,00031896312 \times 10^{-102} = 3,1896312 \times 10^{-106}$

EJERCICIO N°21:

- a) Cada persona debía pagar aproximadamente U\$ 2,5530 $\times 10^4$.
- b) En el cuarto hay $4,03125 \times 10^{27}$ moléculas de oxígeno.

EJERCICIO N°22:

- | | | |
|-----------|---------|-------------------|
| 1. (a) 4 | (b) 2 | (c) $\frac{1}{2}$ |
| 2. (a) 8 | (b) - 4 | (c) - 2 |
| 3. (a) 14 | (b) 4 | (c) 6 |

EJERCICIO N°23:

- | | |
|--------------------------------|-----------------------------|
| 1. (a) $2\sqrt{5}$ | (b) $4\sqrt[3]{2}$ |
| 2. (a) $\frac{2^3\sqrt{2}}{3}$ | (b) $\frac{5\sqrt{3}}{2}$ |
| 3. (a) $3y^2\sqrt{6x}$ | (b) $2x^3\sqrt[3]{2x^2}$ |
| 4. (a) $x^4\sqrt[4]{3y^2}$ | (b) $2x^5\sqrt[5]{5x^3z^4}$ |

EJERCICIO N°24:

- | | |
|------|-------------------|
| a) 2 | b) $2x^5\sqrt{3}$ |
| c) 6 | d) $3x^2$ |

EJERCICIO N°25:

- a) $\sqrt{27} + 5\sqrt{3} - \sqrt{300} = \sqrt{3^3} + 5\sqrt{3} - \sqrt{2^2 \cdot 3 \cdot 5^2} = 3\sqrt{3} + 5\sqrt{3} - 10\sqrt{3} = -2\sqrt{3}$
- b) $\sqrt[5]{96} + \sqrt[5]{3} = \sqrt[5]{2^5 \cdot 3} + \sqrt[5]{3} = 2\sqrt[5]{3} + \sqrt[5]{3} = 3\sqrt[5]{3}$
- c) $\sqrt[4]{48} - \sqrt[4]{3} = \sqrt[4]{2^4 \cdot 3} - \sqrt[4]{3} = 2\sqrt[4]{3} - \sqrt[4]{3} = \sqrt[4]{3}$
- d) $-7\sqrt{80x} - 2\sqrt{125x} = -7\sqrt{2^4 \cdot 5 \cdot x} - 2\sqrt{5^3 \cdot x} = -7 \cdot 2^2\sqrt{5x} - 2 \cdot 5\sqrt{5x} = -24\sqrt{5x} - 10\sqrt{5x} = -34\sqrt{5x}$
- e) $75^{1/2} + 48^{1/2} = \sqrt{75} + \sqrt{48} = \sqrt{5^2 \cdot 3} + \sqrt{2^4 \cdot 3} = 5\sqrt{3} + 4\sqrt{3} = 9\sqrt{3}$
- f) $5\sqrt{3} - 2\sqrt{6} \cdot (1 - \sqrt{8}) = 5\sqrt{3} - 2\sqrt{6} + 2\sqrt{6}\sqrt{8} = 5\sqrt{3} - 2\sqrt{6} + 2\sqrt{48} = 5\sqrt{3} - 2\sqrt{6} + 2\sqrt{2^4 \cdot 3}$
 $= 5\sqrt{3} - 2\sqrt{6} + 8\sqrt{3} = -2\sqrt{6} - 3\sqrt{3}$
- g) $10\sqrt{32} - 6\sqrt{18} = 10\sqrt{2^5} - 6\sqrt{3^2 \cdot 2} = 10 \cdot 2^2\sqrt{2} - 6 \cdot 3\sqrt{2} = 40\sqrt{2} - 18\sqrt{2} = 22\sqrt{2}$
- h) $2\sqrt{50} + 12\sqrt{8} = 2\sqrt{5^2 \cdot 2} + 12\sqrt{2^3} = 2 \cdot 5\sqrt{2} + 12 \cdot 2\sqrt{2} = 10\sqrt{2} + 24\sqrt{2} = 34\sqrt{2}$
- i) $\frac{3}{4}\sqrt{8a^3} - 5\sqrt[4]{64a^6} - \frac{1}{7}a\sqrt{8a} = \frac{3}{4}\sqrt{2^3 a^3} - 5\sqrt[4]{2^6 a^6} - \frac{1}{7}a\sqrt{2^3 a} = \frac{3}{4} \cdot 2 \cdot a\sqrt{2a} - 5 \cdot 2 \cdot a\sqrt[4]{2^2 a^2} - \frac{1}{7}a \cdot 2\sqrt{2a} =$
- j) $\frac{3}{2}a\sqrt{2a} - 10a\sqrt[4]{4a^2} - \frac{2}{7}a\sqrt{2a} = -10a\sqrt[4]{4a^2} + \frac{17}{14}a\sqrt{2a}$

EJERCICIO N°26:

Expresión con radicales	Expresión con exponentes
$\frac{1}{\sqrt{5}}$	$5^{-1/2}$
$\sqrt[3]{15^2}$	$15^{2/3}$
$\sqrt[3]{8^2}$	$8^{2/3}$
$\frac{1}{\sqrt{11}}$	$11^{-1/2}$
$\sqrt[5]{a}$	$a^{1/5}$

EJERCICIO N°27:

a) 3 b) $\frac{2}{3}$ c) $\frac{1}{8}$ d) 2 e) -4 f) $-\frac{3}{5}$ g) -625 h) 0,001

EJERCICIO N°28:

$$1. (a) \frac{(2x^2)^{3/2}}{2^{3/2}x^4} = \frac{2^{3/2}}{2^{3/2}} \cdot \frac{x^3}{x^4} = \frac{1}{x} \qquad (b) \frac{x^{4/3}y^{2/3}}{(xy)^{1/3}} = \frac{x^{4/3}}{x^{1/3}} \cdot \frac{y^{2/3}}{y^{1/3}} = x \cdot y^{1/3}$$

$$2. (a) \frac{x^{-3} \cdot x^{1/2}}{x^{3/2} \cdot x^{-1}} = \frac{x^{-5/2}}{x^{1/2}} = x^{-3} = \frac{1}{x^3} \qquad (b) \frac{5^{-1/2} \cdot 5x^{5/2}}{(5x)^{3/2}} = \frac{5^{-1/2} \cdot 5}{5^{3/2}} \cdot \frac{x^{5/2}}{x^{3/2}} = 5^{-1} \cdot x = \frac{x}{5}$$

EJERCICIO N°29:

1. (a) $\sqrt{3}$ (b) $\sqrt[3]{(x+1)^2}$
2. (a) $\sqrt{x}$ (b) $3x^2$

EJERCICIO N°30:

1. (a) $\sqrt{\sqrt{32}} = \sqrt[4]{32} = 4\sqrt{2}$ (b) $\sqrt[4]{\sqrt{2}x} = \sqrt[8]{2x}$
2. (a) $\sqrt{\sqrt{243}(x+1)} = \sqrt[4]{3^5 \cdot (x+1)} = 3\sqrt[4]{3 \cdot (x+1)}$ (b) $\sqrt{\sqrt[3]{10a^7b}} = \sqrt[6]{10a^7b} = a\sqrt[6]{10ab}$

EJERCICIO N°31:

a) $\frac{\sqrt{3}}{3}$ b) $\frac{8\sqrt[3]{4}}{2}$ c) $\frac{\sqrt{14}+2}{2}$ d) $-3 \cdot (\sqrt{5} - \sqrt{6})$

EJERCICIO N°32:

a) $\sqrt{\frac{1}{2}} = \frac{1}{\sqrt{2}} = \frac{1}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{2}}{2}$
b) $\sqrt{\frac{x}{7}} = \frac{\sqrt{x}}{\sqrt{7}} = \frac{\sqrt{x}}{\sqrt{7}} \cdot \frac{\sqrt{7}}{\sqrt{7}} = \frac{\sqrt{7x}}{7}$
c) $\frac{1}{y^5} = \frac{1}{\sqrt[5]{y^2}} = \frac{1}{\sqrt[5]{y^2}} \cdot \frac{\sqrt[5]{y^3}}{\sqrt[5]{y^3}} = \frac{\sqrt[5]{y^3}}{\sqrt[5]{y^5}} = \frac{\sqrt[5]{y^3}}{y}$

$$\begin{aligned}
\text{d)} \quad & \frac{2x}{\sqrt{x}} = \frac{2x}{\sqrt{x}} \cdot \frac{\sqrt{x}}{\sqrt{x}} = \frac{2x\sqrt{x}}{x} = 2\sqrt{x} \\
\text{e)} \quad & \frac{3}{\sqrt{5}-1} = \frac{3}{\sqrt{5}-1} \cdot \frac{\sqrt{5}+1}{\sqrt{5}+1} = \frac{3(\sqrt{5}+1)}{(\sqrt{5})^2-1^2} = \frac{3\sqrt{5}+3}{5-1} = \frac{3\sqrt{5}+3}{4} \\
\text{f)} \quad & \frac{5}{3\sqrt{2}-1} = \frac{5}{3\sqrt{2}-1} \cdot \frac{3\sqrt{2}+1}{3\sqrt{2}+1} = \frac{5(3\sqrt{2}+1)}{(3\sqrt{2})^2-1^2} = \frac{15\sqrt{2}+5}{9-1} = \frac{15\sqrt{2}+5}{8} \\
\text{g)} \quad & \frac{2}{\sqrt[3]{x}} = \frac{2}{\sqrt[3]{x}} \cdot \frac{\sqrt[3]{x^2}}{\sqrt[3]{x^2}} = \frac{2\sqrt[3]{x^2}}{\sqrt[3]{x^3}} = \frac{2\sqrt[3]{x^2}}{x} \\
\text{h)} \quad & \sqrt[3]{\frac{8}{3}} = \frac{\sqrt[3]{8}}{\sqrt[3]{3}} = \frac{2}{\sqrt[3]{3}} = \frac{2}{\sqrt[3]{3}} \cdot \frac{\sqrt[3]{3^2}}{\sqrt[3]{3^2}} = \frac{2\sqrt[3]{3^2}}{\sqrt[3]{3^3}} = \frac{2\sqrt[3]{3^2}}{3} = \frac{2}{3}\sqrt[3]{9} \\
\text{i)} \quad & \frac{8}{a^{\frac{1}{3}}} = \frac{8}{\sqrt[3]{a}} = \frac{8}{\sqrt[3]{a}} \cdot \frac{\sqrt[3]{a^2}}{\sqrt[3]{a^2}} = \frac{8\sqrt[3]{a^2}}{\sqrt[3]{a^3}} = \frac{8\sqrt[3]{a^2}}{a} \\
\text{j)} \quad & \left(\sqrt{3} + \frac{1}{\sqrt{3}}\right)^{-2} = \left(\frac{3+1}{\sqrt{3}}\right)^{-2} = \left(\frac{4}{\sqrt{3}}\right)^{-2} = \left(\frac{\sqrt{3}}{4}\right)^2 = \frac{3}{16} \\
\text{k)} \quad & \frac{\sqrt{x}+\sqrt{y}}{\sqrt{x}-\sqrt{y}} = \frac{\sqrt{x}+\sqrt{y}}{\sqrt{x}-\sqrt{y}} \cdot \frac{\sqrt{x}+\sqrt{y}}{\sqrt{x}+\sqrt{y}} = \frac{(\sqrt{x}+\sqrt{y})^2}{(\sqrt{x})^2-(\sqrt{y})^2} = \frac{(\sqrt{x}+\sqrt{y})^2}{x-y}
\end{aligned}$$