0a. Lista de Exercícios
Números reais e suas operações

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1-) Calcule o valor das expressões abaixo:

$$(-3)^3 \qquad (Resp.: \ -27)$$

$$\left(\frac{2}{3}\right)^3 \qquad (Resp.: \ \frac{8}{27})$$

$$\left(-\frac{1}{3}\right)^4 \qquad (Resp.: \ \frac{1}{81})$$

$$-2^2 \qquad (Resp.: \ -4)$$

$$-\left(-\frac{3}{2}\right)^3 \qquad (Resp.: \ \frac{27}{8})$$

$$(-1)^{10} \qquad (Resp.: \ 1)$$

$$(-1)^{13} \qquad (Resp.: \ -1)$$

$(-4)^0 \qquad (Resp.:\ 1)$

$-5^0 \qquad (Resp.:\ -1)$

$-(-1)^{15} \qquad (Resp.:\ 1)$

2-) Calcular:

$(-2)^{-1} \qquad (Resp.:\ -\frac{1}{2})$

$-3^{-1} \qquad (Resp.:\ -\frac{1}{3})$

$2^{-2} \qquad (Resp.:\ \frac{1}{4})$

$-5^{-2} \qquad (Resp.:\ -\frac{1}{25})$

$\left(\frac{1}{3}\right)^{-2} \qquad (Resp.:\ 9)$

$\left(-\frac{3}{2}\right)^{-3} \qquad (Resp.:\ -\frac{8}{27})$

$-\left(\frac{2}{5}\right)^{-2} \qquad (Resp.:\ -\frac{25}{4})$

$(0.1)^{-2} \qquad (Resp.:\ 100)$

$(0.25)^{-3} \qquad (Resp.:\ 64)$

$$(0.75)^{-2} \qquad (Resp.:\ \frac{16}{9})$$

$$\frac{1}{2^{-3}} \qquad (Resp.:\ 8)$$

$$\frac{1}{(-3)^{-3}} \qquad (Resp.:\ -27)$$

$$\frac{1}{(0.01)^{-2}} \qquad (Resp.:\ 0.0001)$$

3-) Simplificar as expressões:

$$\sqrt{8}+\sqrt{32}+\sqrt{72}-\sqrt{50} \qquad (Resp.:\ 7\sqrt{2})$$

$$5\sqrt{108}+2\sqrt{243}-\sqrt{27}+2\sqrt{12} \qquad (Resp.:\ 49\sqrt{3})$$

$$\sqrt{20}-\sqrt{24}+\sqrt{125}-\sqrt{54} \qquad (Resp.:\ 7\sqrt{5}-5\sqrt{6})$$

$$\sqrt{2000}+\sqrt{200}+\sqrt{20}+\sqrt{2} \qquad (Resp.:\ 22\sqrt{5}+11\sqrt{2})$$

$$\sqrt[3]{128}-\sqrt[3]{250}+\sqrt[3]{54}-\sqrt[3]{16} \qquad (Resp.:\ 0)$$

$$\sqrt[3]{375}-\sqrt[3]{24}+\sqrt[3]{81}-\sqrt[3]{192} \qquad (Resp.:\ 2\sqrt[3]{3})$$

$$\sqrt{81x^3} \qquad (Resp.:\ 9x\sqrt{x})$$

$$\sqrt{45x^3y^2} \qquad (Resp.:\ 3x|y|\sqrt{5x})$$

$$\sqrt{12x^4y^5} \qquad (Resp.:\ 2x^2y^2\sqrt{3y})$$

$$\sqrt{8x^2} \qquad (Resp.:\ 2|x|\sqrt{2})$$

4-) Efetuar as operações:

$$2\sqrt{3}(3\sqrt{5} - 2\sqrt{20} - \sqrt{45}) \qquad (Resp.:\ -8\sqrt{15})$$

$$\frac{\sqrt{20} - \sqrt{45} + 3\sqrt{125}}{2\sqrt{5}} \qquad (Resp.:\ 7)$$

$$(6 + \sqrt{2})(5 - \sqrt{2}) \qquad (Resp.:\ 28 - \sqrt{2})$$

$$(3 + \sqrt{5})(7 - \sqrt{5}) \qquad (Resp.:\ 16 + 4\sqrt{5})$$

$$(\sqrt{2} + 3)(\sqrt{2} - 4) \qquad (Resp.:\ -10 - \sqrt{2})$$

$$(2\sqrt{3} + 3\sqrt{2})(5\sqrt{3} - 2\sqrt{2}) \qquad (Resp.:\ 18 + 11\sqrt{6})$$

5-) Expressar sob a forma de potência os seguintes radicais:

$$\sqrt{5} \qquad (Resp.:\ 5^{1/2})$$

$$\sqrt[3]{4} \qquad (Resp.:\ 2^{2/3})$$

$$\sqrt[4]{27} \qquad (Resp.:\ 3^{3/4})$$

$$\sqrt{\sqrt{2}} \qquad (Resp.:\ 2^{1/4})$$

$$\sqrt[4]{\sqrt[3]{5}} \qquad (Resp.:\ 5^{1/12})$$

$$(\sqrt[3]{2^2})^2 \qquad (Resp.:\ 2^{4/3})$$

$$\frac{1}{\sqrt{2}} \qquad (Resp.:\ 2^{-1/2})$$

$$\frac{1}{\sqrt[3]{9}} \qquad (Resp.:\ 3^{-2/3})$$

$$\left(\frac{1}{\sqrt[4]{8}}\right)^2 \qquad (Resp.:\ 2^{-3/2})$$

6-) Simplificar as seguintes expressões:

$$2^{2/3}2^{-1/5}2^{4/5} \qquad (Resp.:\ 2^{19/15})$$

$$3^{-1/3}3^{1/5}3^{1/2} \qquad (Resp.:\ 3^{11/30})$$

$$\frac{5^{-1/2}5^{1/3}}{5^{2/5}5^{-3/2}} \qquad (Resp.:\ 5^{14/15})$$

$$\frac{3^{1/2}3^{-2/3}}{3^{1/5}3^{1/8}3^{1/60}} \qquad (Resp.:\ 3^{-61/120})$$

$$\frac{3^{1/2}+3^{-2/3}}{3^{1/2}3^{-2/3}} \qquad (Resp.:\ 3^{2/3}+3^{-1/2})$$

$$(27^{2/3}-27^{-2/3})(16^{3/4}-16^{-3/4}) \qquad (Resp.:\ 70)$$

$$(125^{2/3}+16^{1/2}+343^{1/3})^{1/2} \qquad (Resp.:\ 6)$$

References

[1] **Fundamentos de Matemática Elementar**, 5a. edição, Gelzon Iezzi, Osvaldo Dolce & Carlos Murakami, Atual Editora, 1977-1981

[2] **Matemática Aplicada**, 7a. edição, Ronald J. Harshbarger & James J. Reynolds, McGraw-Hill, 2006