

Papel e Caneta 1

Aritmética: Frações, raízes, potências, exponenciais, logaritmos.

Sem calculadora, sem IA, sem ajuda de ninguém.

Tabela 1: Cálculo mental

1	$3 \times 8 =$
2	$5 \times 4 =$
3	$7 \times 6 =$
4	$12 \times 2 =$
5	$-3 \times 9 =$
6	$-4 \times (-3) =$
7	$8 \times (-8) =$
8	$12(10) =$
9	$3.5 \times 2 =$
10	$0.1 \times 9 =$

Tabela 2: Cálculo mental

$12 \div 3 =$
$45 \div 15 =$
$81 \div 9 =$
$3 \div 6 =$
$2.5 \div 0.5 =$
$54 \div 26 \approx$
$1.23 \times 100 =$
$100 \times 100 =$
$55 \div 11 =$
$9 \div 2 =$

Tabela 3: Operações

1	$\frac{7}{8} + \frac{5}{12} =$
2	$\frac{15}{18} - \frac{5}{9} =$
3	$\frac{2}{3} \cdot \frac{9}{10} =$
4	$\frac{5}{6} \div \frac{10}{12} =$
5	$\sqrt{98} =$
6	$\sqrt[4]{81} =$
7	$3^4 =$
8	$\frac{x^5}{x^2} =$
9	$\log_2(32) =$
10	$e^{\ln 7} =$

Tabela 4: Verdadeiro ou Falso?

$\frac{2}{4} = \frac{1}{2}$	
$a^m \cdot a^n = a^{m+n}$	
$\sqrt{36} = \pm 6$	
$5^{-2} = \frac{1}{25}$	
$\log_{10}(0) = -\infty$	
$\ln(e^2) = 2$	
$2^{\ln 2} = 2$	
$\sqrt[3]{-27} = -3$	
$\log(ab) = \log(a) + \log(b)$	
$10^{\log_{10}(7)} = 7$	

Tabela 5: Operações

1	$\frac{11}{15} + \frac{7}{20} =$
2	$\frac{3}{8} - \frac{1}{16} =$
3	$\frac{4}{9} \cdot \frac{6}{7} =$
4	$\frac{8}{21} \div \frac{4}{7} =$
5	$\sqrt{200} =$
6	$\sqrt[5]{32} =$
7	$10^{-2} =$
8	$(x^3)^2 =$
9	$\log_5(125) =$
10	$\ln(1/e) =$

Tabela 6: Verdadeiro ou Falso?

$\frac{3}{9} = \frac{1}{3}$	
$a^0 = 0$	
$a^{-1} = \frac{1}{a}$	
$\sqrt{49} = 7$	
$\log_b(1) = 0$	
$\ln(e) = 1$	
$e^{\ln 5} = 5$	
$2^{10} = 1024$	
$\sqrt[4]{16} = 2$	
$\log(a + b) = \log(a) + \log(b)$	

Tabela 7: Operações

1	$\frac{13}{18} + \frac{5}{12} =$
2	$\frac{2}{3} - \frac{5}{9} =$
3	$\frac{7}{10} \cdot \frac{15}{14} =$
4	$\frac{25}{36} \div \frac{5}{6} =$
5	$\sqrt{245} =$
6	$\sqrt[3]{125} =$
7	$4^3 =$
8	$\frac{(x^2)^3}{x^4} =$
9	$\log_3(81) =$
10	$\ln(\sqrt{e}) =$

Tabela 8: Verdadeiro ou Falso?

$\frac{8}{12} = \frac{2}{3}$	
$a^m \div a^n = a^{m-n}$	
$(a^m)^n = a^{mn}$	
$\sqrt{0} = 0$	
$\log_b(b) = 1$	
$\ln(0) = -\infty$	
$e^0 = 1$	
$2^4 = 16$	
$\sqrt[3]{1} = 1$	
$\log(10) = 1$ (base 10)	

Tabela 9: Operações

1	$\frac{17}{24} + \frac{5}{8} =$
2	$\frac{9}{14} - \frac{3}{7} =$
3	$\frac{11}{15} \cdot \frac{5}{22} =$
4	$\frac{9}{20} \div \frac{3}{10} =$
5	$\sqrt{128} =$
6	$\sqrt[6]{64} =$
7	$5^0 =$
8	$\frac{x^7}{x^3} =$
9	$\log_4(64) =$
10	$\ln(e^{-2}) =$

Tabela 10: Verdadeiro ou Falso?

$\frac{10}{25} = \frac{2}{5}$	
$a^1 = a$	
$a^{-2} = \frac{1}{a^2}$	
$\sqrt{81} = 9$	
$\log_b(b^k) = k$	
$\ln(1) = 0$	
$e^{-1} = \frac{1}{e}$	
$3^2 = 6$	
$\sqrt[5]{32} = 2$	
$\log(100) = 2$ (base 10)	

Tabela 11: Operações

1	$\frac{3}{4} + \frac{2}{5} =$
2	$\frac{7}{9} - \frac{4}{9} =$
3	$\frac{5}{6} \cdot \frac{9}{10} =$
4	$\frac{12}{15} \div \frac{4}{5} =$
5	$\sqrt{50} =$
6	$\sqrt[3]{27} =$
7	$2^5 =$
8	$\frac{x^4 \cdot x^3}{x^2} =$
9	$\log_{10}(1000) =$
10	$\ln(e^3) =$

Tabela 12: Verdadeiro ou Falso?

$\log(1) = 0$	
$e^0 = 1$	
$\sqrt{a^2} = a$, para todo $a \in \mathbb{R}$	
$\log(ab) = \log(a) + \log(b)$	
$2^{\log_2(7)} = 7$	
$\log(a+b) = \log a + \log b$	
$\frac{1}{\sqrt{2}} = \sqrt{\frac{1}{2}}$	
$\ln(1) = 1$	
$\frac{x^0}{y^0} = 1$ (com $x, y \neq 0$)	
$\sqrt[3]{-8} = -2$	

Tabela 13: Operações

1	$\frac{7}{8} + \frac{5}{12} =$
2	$\frac{15}{18} - \frac{5}{9} =$
3	$\frac{2}{3} \cdot \frac{9}{10} =$
4	$\frac{5}{6} \div \frac{10}{12} =$
5	$\sqrt{98} =$
6	$\sqrt[4]{81} =$
7	$3^4 =$
8	$\frac{x^5}{x^2} =$
9	$\log_2(32) =$
10	$e^{\ln 7} =$

Tabela 14: Verdadeiro ou Falso?

$\frac{2}{4} = \frac{1}{2}$	
$a^m \cdot a^n = a^{m+n}$	
$\sqrt{36} = \pm 6$	
$5^{-2} = \frac{1}{25}$	
$\log_{10}(0) = -\infty$	
$\ln(e^2) = 2$	
$2^{\ln 2} = 2$	
$\sqrt[3]{-27} = -3$	
$\log(ab) = \log a + \log b$	
$10^{\log_{10}(7)} = 7$	

Tabela 15: Verdadeiro ou Falso?

1	$\frac{2^0}{3^0 + 3^{-1}} = \frac{3}{4}$	
2	$(-2)^2 = -4$	
3	$2.2 \times 10^3 = 2200$	
4	$3 \times 10^{-6} = \frac{3}{10^6}$	
5	$132.27 = 1.3227 \times 10^{-2}$	
6	$\sqrt{2^2 + 3^2} = 5$	
7	$3(a+b) = (3+a)(3+b)$	
8	$(a-b)(a-b) = (a-b)^2$	
9	$a - (-b - c) = a + b + c$	
10	$a(b+c) = ab + ac$	

Tabela 16: Verdadeiro ou Falso?

$\frac{2 \times 3 \times a}{2} = 3a$	
$\frac{5a+b}{5} = a + \frac{b}{5}$	
$\frac{15a+60b}{3} = 5a + 20b$	
$(a+b)^3 = (a+b)(a^2 + 2ab + b^2)$	
$\frac{3}{6^3+3^6} = \frac{1}{2 \times 6^2+3^5}$	
$\frac{2+3+a}{2} = 3 + a$	
$a \times (-b - c) = -ab - ac$	
$(-a-b)^2 = (a+b)^2$	
$(a+b)^{-3} = \frac{1}{(a+b)^3}$	
$\log_2(16+16) = \log_2(16) + \log_2(16)$	

Tabela 17: Verdadeiro ou Falso?

1	$8^{-2/3} = \frac{1}{4}$	
2	$27^{4/3} = 81$	
3	$27^{4/3} = 81$	
4	$\frac{13}{7} \approx 1$	
5	$\frac{13}{7} 1\frac{6}{7}$	
6	$\frac{7}{8} \approx 1$	
7	$\sqrt[5]{a^5} = a$	
8	$\sqrt[2]{(-2)^2} = -2$	
9	$2^3 \div 5^3 = \left(\frac{2}{5}\right)^3$	
10	$3^{1/3} \times 4^{1/3} = 12^{1/3}$	

Tabela 18: Verdadeiro ou Falso?

$0.2\% = \frac{2}{100}$	
$e\% \approx 0.027$	
$-5\% = -0.05$	
$25\% = 0.25$	
$1.2 = 120\%$	
$1000 = 10\%$	
$4(2\%) = 0.08$	
$25\% \times 30 = 7.5$	
$a = ((a/b)100)\% \times b$	
$25\% = 1/4$	

Tabela 19: Verdadeiro ou Falso?

1	$1\text{ m} = 10\text{ cm}$	
2	$1\text{ hm} = 100\text{ m}$	
3	$1\text{ m}^2 = 100\text{ cm}^2$	
4	$1\text{ dm}^3 = 1000\text{ cm}^3$	
5	$1\text{ dm}^3 = 1\text{ litro}$	
6	$1\text{ hora} = 3600\text{ s}$	
7	$25\text{ m}^3 = 25 \times 10^6\text{ cm}^3$	
8	$2\text{ mm}^2 = (1\text{ mm}) \times (1\text{ mm})$	
9	$40\text{ m}^2 = (4\text{ m})(10\text{ m})$	
10	$1\text{ ha} = 10000\text{ m}^2$	

Tabela 20: Verdadeiro ou Falso?

$\sqrt{7}\sqrt{8} = \sqrt{56}$	
$\frac{\frac{3}{4}}{\frac{2}{5}} = \frac{6}{20}$	
$\frac{4}{20} = (4/5) \div 4$	
$\frac{4}{5} \div 4 = \frac{4}{20}$	
$\frac{4}{5} \div 4 = \frac{16}{20}$	
$2 \times \frac{3}{5} = \frac{6}{5}$	
$2 \times \frac{3}{5} = 2 \div \frac{5}{3}$	
$(4 \div 2) \div 2 = 4 \div (2 \div 2)$	
$(4 \times 2) \times 2 = 4 \times (2 \times 2)$	
$-4 \div 2 = 4 \div (-2)$	

Tabela 21: Verdadeiro ou Falso?

1	$\log_5(8 + 5) = \log_5(8) \times \log_5(5)$	
2	$\log_5(8 \times 5) = \log_5(8) \times \log_5(5)$	
3	$(5\%) \log_3(81) = 2 \times 10^{-1}$	
4	$e^{\ln(4)} = e^{-4}$	
5	$\log_{0.2}(8) > \log_{0.4}(8)$	
6	$3 < \log_7(25) < 4$	
7	$\log_2(30) - \log_2(7.5) = 4$	
8	$\log_{10}(2^{-5}) = -5$	
9	$\sqrt[3]{y^{-2}} = \frac{1}{y^6}$	
10	$\sqrt{\frac{a}{b}} = \frac{\sqrt{a}}{\sqrt{b}}$	

Tabela 22: Verdadeiro ou Falso?

$\sqrt{7} + \sqrt{8} = \sqrt{15}$	
$\log_3(3 \cdot 5^2) = 2 \log_3(3 \cdot 5)$	
$\log_a(a^b) = b$	
$\log_3(29) > 3$	
$0 < \ln(2) < 1$	
$2^{\log_2(3)} = 3$	
$\log_{10}(10\%) = -2$	
$\log_{0.1}(100) = -2$	
$2 \log_e(e) = 2$	
$-3 \log_2(5) = \log_2(5^{-3})$	

Tabela 23: Verdadeiro ou Falso?

1	$2^{3/5} = \sqrt[5]{2^3}$	
2	$\sqrt{2^{-2}} = -2^{1/2}$	
3	$2^{1/3} \times 2^{1/3} = 2^{2/9}$	
4	$(a+b)^2 = a^2 + b^2$	
5	$\sqrt{a-b} = \sqrt{a} - \sqrt{b}$	
6	$\sqrt{a/b} = \sqrt{a}/\sqrt{b}$	
7	$2 \times \frac{a}{2+b} = \frac{a}{b}$	
8	$2 \times \frac{a}{2 \times b} = \frac{a}{b}$	
9	$\frac{2+a}{2b} = \frac{a}{b}$	
10	$\frac{2+a}{2b} = \frac{1+a}{b}$	

Tabela 24: Verdadeiro ou Falso?

$\frac{12}{3} \times \frac{6}{4} = \frac{12}{4} \times \frac{6}{3}$	
$\frac{4}{-5} \times \frac{2}{3} = \frac{4}{5} \times \left(-\frac{2}{3}\right)$	
$\frac{2}{3} \div \frac{3}{2} = 1$	
$\frac{1}{1+1/2} = \frac{3}{2}$	
$(-3)^4 = 3^4$	
$(-3)^3 = 3^3$	
$5^{-2} = 5^2$	
$\frac{4}{4+5} = \frac{1}{1+5}$	
$-2^2 = 4$	
$3^{-1}(3) = 1$	