71- $\sqrt{2+6} \circ \sqrt{2} + \sqrt{6} \Rightarrow 2\sqrt{2} \circ \sqrt{2} + \sqrt{3.2}$

$2\sqrt{2} < \sqrt{2}(\sqrt{3}+1)$

72- $\sqrt{4} + \sqrt{9} \circ \sqrt{13} \Rightarrow 5 > \sqrt{13}$

73- $(3^{-2})^{-\frac{1}{2}} \circ 3 = (3^{-2 \cdot -\frac{1}{2}}) \circ 3 \Rightarrow 3^1 = 3$

74- $(2^{-3})^{\frac{1}{3}} \circ 2 \Rightarrow 2^{-3 \cdot \frac{1}{3}} \circ 2 \Rightarrow 2^{-1} < 2$

75- $\sqrt[4]{(-2)^4} \circ -2 \Rightarrow -2 = -2$

76- $\sqrt[3]{(-2)^3} \circ -2 \Rightarrow -2 = -2$

77- $2^{\frac{2}{3}} \circ 3^{\frac{3}{4}} \Rightarrow \sqrt[3]{2^2} \circ \sqrt[4]{3^3} \Rightarrow \sqrt[3]{4} < \sqrt[4]{27}$

78- $4^{-\frac{2}{3}} \circ 3^{-\frac{3}{4}} \Rightarrow \sqrt[3]{\frac{1}{15}} \circ \sqrt[4]{\frac{1}{27}} \Rightarrow \sqrt[12]{\frac{1}{15}} > \sqrt[12]{\frac{1}{15}}$

79- $I = 0,45 \cdot \sqrt{d} \Rightarrow 0,45 \sqrt{200} \Rightarrow 0,45 \cdot 10\sqrt{2}$

63. $\sqrt[4]{\frac{3x^8y^2}{8x^2}} : \frac{x\sqrt[4]{3x^2y^2}}{\sqrt[4]{2^3}} \cdot \frac{\sqrt[4]{2}}{\sqrt[4]{2}} = \frac{x\sqrt[4]{6x^2y^2}}{2}$

64. $\sqrt[5]{\frac{4x^6y}{9x^3}} = \sqrt[5]{\frac{4x^3y}{9}} = \frac{\sqrt[5]{4x^3y}}{\sqrt[5]{3^2}} \cdot \frac{\sqrt[5]{3^3}}{\sqrt[5]{3^3}}$

$\frac{\sqrt[5]{108x^3y}}{3}$

65. $\sqrt[3]{\frac{4x^2}{y^2}} \cdot \sqrt[3]{\frac{2x^2}{y}} = \frac{\sqrt[3]{4x^2}}{\sqrt[3]{y^2}} \cdot \frac{\sqrt[3]{2x^2}}{\sqrt[3]{y}} = \frac{\sqrt[3]{8x^4}}{y}$

$\frac{2x\sqrt{x}}{y}$

66. $\sqrt[5]{9ab^6} \cdot \sqrt[5]{27a^2b^{-1}} = \sqrt[5]{3^2 \cdot a \cdot b^5 \cdot 3^3 \cdot a^2} = \sqrt[5]{3^5a^3b^5}$

$3b\sqrt[5]{a^3}$

67. $3\sqrt{48} - 2\sqrt{108} = 3\sqrt{2^4 \cdot 3} - 2 \cdot \sqrt{3^3 \cdot 2^2}$

$12\sqrt{3} - 12\sqrt{3} = 0$

68. $2\sqrt{175} - 4\sqrt{28} = 2 \cdot \sqrt{5^2 \cdot 7} - 4 \cdot \sqrt{2^2 \cdot 7}$

$10\sqrt{7} - 8\sqrt{7} = 2\sqrt{7}$

69. $\sqrt{x^3} - \sqrt{4xy^2} = x\sqrt{x} - 2y\sqrt{x}$

70. $\sqrt{18x^2y} + \sqrt{2y^3} = 3x\sqrt{2y} + y\sqrt{2y}$

53- $\frac{a^{\frac{3}{5}} \cdot a^{\frac{1}{3}}}{a^{\frac{3}{2}}} = \frac{a^{\frac{14}{15}}}{a^{\frac{3}{2}}} = \frac{a^{\frac{14}{15}}}{\sqrt[2]{a^3}} = \frac{a^{\frac{14}{15}}}{a\sqrt{a}}$

54- $(x^2 y^4)^{\frac{1}{2}} = \sqrt{x^2 y^4} = x \cdot y^2$

55- $\frac{(a^{5/3} \cdot b^{3/4}) \cdot (3a^{1/3} \cdot b^{5/4})}{3\sqrt[3]{a^5} \cdot (b^2)} : \frac{\sqrt[3]{a^5} \cdot 3\sqrt[3]{a} \cdot (b^{\frac{3}{4}} \cdot b^{\frac{5}{4}})}{} = 3a^2 \cdot b^2$

56- $\left(\frac{x^{\frac{1}{2}}}{y^{2/3}}\right)^6 = \frac{x^{\frac{1}{2} \cdot 6}}{y^{\frac{2}{3} \cdot 6}} = \frac{x^3}{y^4}$

57- $\left(\frac{-8x^5}{y^{-3}}\right)^{\frac{2}{3}} = (-8x^5 y^3)^{\frac{2}{3}} = \sqrt[3]{64x^{12}y^6} = 4x^4 y^2$

58- $\frac{(p^2 q^4)^{\frac{1}{2}}}{(27 q^3 p^5)^{\frac{1}{3}}} = \frac{\sqrt{p^2 q^4}}{\sqrt[3]{3^3 q^3 p^5}} = \frac{p \cdot q^2}{3qp^2} = \frac{q}{3p}$

59- $\frac{(x^9 y^6)^{-\frac{1}{3}}}{(x^6 y^2)^{-\frac{1}{2}}} = \frac{\sqrt[3]{(x^9 y^6)^{-1}}}{\sqrt{(x^6 y^2)^{-1}}} = \frac{\frac{1}{\sqrt[3]{x^9 y^6}}}{\frac{1}{\sqrt{x^6 y^2}}} = \frac{1}{\sqrt[3]{x^9 y^6}} \cdot \sqrt{x^6 y^2}$

$\frac{x^3 \cdot y}{x^3 y^2} = \frac{1}{y}$

60- $\left(\frac{2x^{\frac{1}{2}}}{y^{2/3}}\right) \cdot \left(\frac{3x^{-2/3}}{y^{3/2}}\right) = \frac{6}{y\sqrt[6]{xy}}$

Cálculo mental grande

61- $\sqrt{9x^{-6}y^4} = 3y^2\sqrt{x^{-6}} = 3y^2 \cdot \frac{1}{\sqrt{x^6}} = \frac{3y^2}{x^3}$

62- $\sqrt{16y^8 z^{-2}} = 4y^4 \frac{1}{\sqrt{z^2}} = \frac{4y^4}{z}$

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

40. $\sqrt[5]{x^2y^3} = (x^2 \cdot y^3)^{\frac{1}{5}}$

41. $2x\sqrt[3]{x^2y} = 2x(x^2 \cdot y)^{\frac{1}{3}}$

42. $xy\sqrt[4]{xy^3} = xy \cdot (x \cdot y^3)^{\frac{1}{4}}$

43. $a^{\frac{3}{4}} \cdot b^{\frac{1}{4}} = \sqrt[4]{a^3} \cdot \sqrt[4]{b} = \sqrt[4]{a^3 b}$

44. $x^{\frac{2}{3}} \cdot y^{\frac{1}{3}} = \sqrt[3]{x^2} \cdot \sqrt[3]{y} = \sqrt[3]{x^2 y}$

45. $x^{\frac{-5}{3}} = \sqrt[3]{x^{-5}}$

46. $(xy)^{\frac{-3}{4}} = \sqrt[4]{(xy)^{-3}}$

47. $\sqrt{\sqrt{2x}} = \sqrt[4]{2x}$

48. $\sqrt[3]{\sqrt{3x^2}} = \sqrt[6]{3x^2}$

49. $\sqrt[4]{\sqrt{xy}} = \sqrt[8]{xy}$

50. $\sqrt[3]{\sqrt{ab}} = \sqrt[6]{ab}$

51. $\frac{\sqrt[5]{a^2}}{\sqrt[3]{a}} = \frac{\sqrt[5]{a^2}}{\sqrt[3]{a}} \cdot \frac{\sqrt[4]{a^2}}{\sqrt[4]{a^2}} = \frac{\sqrt[5]{a^2} \cdot \sqrt[3]{a^2}}{a}$

52. $\sqrt{a} \cdot \sqrt[3]{a^2} = a^{\frac{1}{2}} \cdot a^{\frac{2}{3}} = a^{\frac{7}{6}} = \sqrt[6]{a^7}$

26- $\sqrt[4]{192} = \sqrt[4]{2^4 \cdot 2^2 \cdot 3} = 2\sqrt[4]{12}$

27- $\sqrt{2x^3 \cdot y^4} = \sqrt{2x^2 \cdot x \cdot y^2 \cdot y^2} = xy^2\sqrt{2x}$

28- $\sqrt[3]{-27 \cdot x^3 \cdot y^6} = \sqrt[3]{-3^3 \cdot x^3 \cdot y^3 y^3} = -3xy^2$

29- $\sqrt[4]{3x^8 \cdot y^6} = x^2 y \sqrt[4]{3 \cdot y^2}$

30- $\sqrt[3]{8x^5 y^4} = \sqrt[3]{2^3 \cdot x^3 \cdot x^3 \cdot y^3 \cdot y} = 2x^2 y \sqrt[3]{y}$

31- $\sqrt[5]{96x^{10}} = \sqrt[5]{2^5 \cdot x^5 x^5} = 2x^2\sqrt[5]{3}$

32- $\sqrt{108x^4 \cdot y^9} = \sqrt{2^2 \cdot 3^2 3 \cdot x^2 x^2 \cdot y^2 y^2 y^2 y^2 y} = 6x^2 y^4 \sqrt{3y}$

33- $\frac{4}{\sqrt[3]{2}} \cdot \frac{\sqrt[3]{2^2}}{\sqrt[3]{2^2}} = \frac{4 \cdot \sqrt[3]{2}}{\sqrt[3]{2 \cdot 2^2}} = \frac{4\sqrt[3]{2}}{2}$

34- $\frac{1}{\sqrt{5}} = \frac{1}{\sqrt{5}} \cdot \frac{\sqrt{5}}{\sqrt{5}} = \frac{\sqrt{5}}{5}$

35- $\frac{1}{\sqrt[5]{x^2}} \cdot \frac{\sqrt[5]{x^3}}{\sqrt[5]{x^3}} = \frac{\sqrt[5]{x^3}}{x}$

36- $\frac{2}{\sqrt[4]{y}} \cdot \frac{\sqrt[4]{y^3}}{\sqrt[4]{y^3}} = \frac{2\sqrt[4]{y^3}}{\sqrt[4]{y \cdot y^3}} = \frac{2\sqrt[4]{3}}{y}$

37- $\sqrt[3]{\frac{x^2}{y}} = \frac{\sqrt[3]{x^2}}{\sqrt[3]{y}} \cdot \frac{\sqrt[3]{y^2}}{\sqrt[3]{y^2}} = \frac{\sqrt[3]{x^2 \cdot y^2}}{y}$

38- $\sqrt[5]{\frac{a^2}{b^2}} = \sqrt[5]{\frac{a^2}{b^2}} \cdot \frac{\sqrt[5]{b^3}}{\sqrt[5]{b^3}} = \frac{\sqrt[5]{b^3 \cdot a^2}}{b}$

13- $\sqrt[4]{256} = 4$

14- $\sqrt[5]{3125} = 5$

15- $\sqrt[3]{15,625} = \frac{5}{2}$

16- $\sqrt{1,225} = \frac{7}{2}$

17- $81^{\frac{3}{2}} \iff \sqrt[2]{81^3} = 729$

18- $32^{-2/5} \iff \sqrt[5]{32^{-2}} = \frac{1}{4}$

19- $16^{\frac{5}{4}} \iff \sqrt[4]{16^5} = 32$

20- $27^{-\frac{4}{3}} \iff \sqrt[3]{27^{-4}} = \frac{1}{81}$

21- $\left(-\frac{1}{8}\right)^{-\frac{1}{3}} \iff \sqrt[3]{\left(\frac{1}{8}\right)^{-1}} = \sqrt[3]{\frac{-8}{1}} = -2$

22- $\left(-\frac{125}{64}\right)^{-\frac{1}{3}} \iff \sqrt[3]{\left(\frac{-125}{64}\right)^{-1}} \iff \sqrt[3]{\frac{-64}{125}} \iff \frac{\sqrt[3]{64}}{\sqrt[3]{125}}$

$-\frac{4}{5}$

23- $\sqrt{288} \iff \sqrt{2^2 \cdot 2^2 \cdot 2 \cdot 3^2} \iff 12\sqrt{2}$

24- $\sqrt[3]{500} = \sqrt[3]{5^3 \cdot 2^2} = 5\sqrt[3]{4}$

25- $\sqrt[3]{-250} = \sqrt[3]{-5^3 \cdot 2} = -5\sqrt[3]{2}$

Lista 1 de Exercícios

1- Raiz quadrada de 81
$\sqrt{81} = 9 \iff 9 \cdot 9 = 81$

2- Raiz quarta de 81
$\sqrt[4]{81} = 3 \iff 3 \cdot 3 \cdot 3 \cdot 3 = 81$

3- Raiz cúbica de 64
$\sqrt[3]{64} = 4 \iff 4^3$

4- Raiz quinta de 243
$\sqrt[5]{243} = 3 \iff 3^5$

5- Raiz quadrada de $\frac{16}{9}$
$\sqrt{\frac{16}{9}} = \frac{\sqrt{16}}{\sqrt{9}} = \frac{4}{3}$

6- Raiz cúbica de $-27/8$
$\sqrt[3]{\frac{-27}{8}} = \frac{\sqrt[3]{-27}}{\sqrt[3]{8}} = \frac{-3}{2}$

7- $\sqrt[8]{144} = 12$

8- $\sqrt{-16} = \nexists \mathbb{R}$

9- $\sqrt[3]{-216} = -6 \cdot -6 \cdot -6 = -216 \iff -6^3 \iff -6$

10- $\sqrt[3]{216} = 6$

11- $\sqrt[3]{-\frac{64}{27}} = \frac{\sqrt[3]{64}}{\sqrt[3]{27}} = -\frac{4}{3}$

12- $\sqrt{\frac{64}{25}} = \frac{\sqrt{64}}{\sqrt{25}} = \frac{8}{5}$