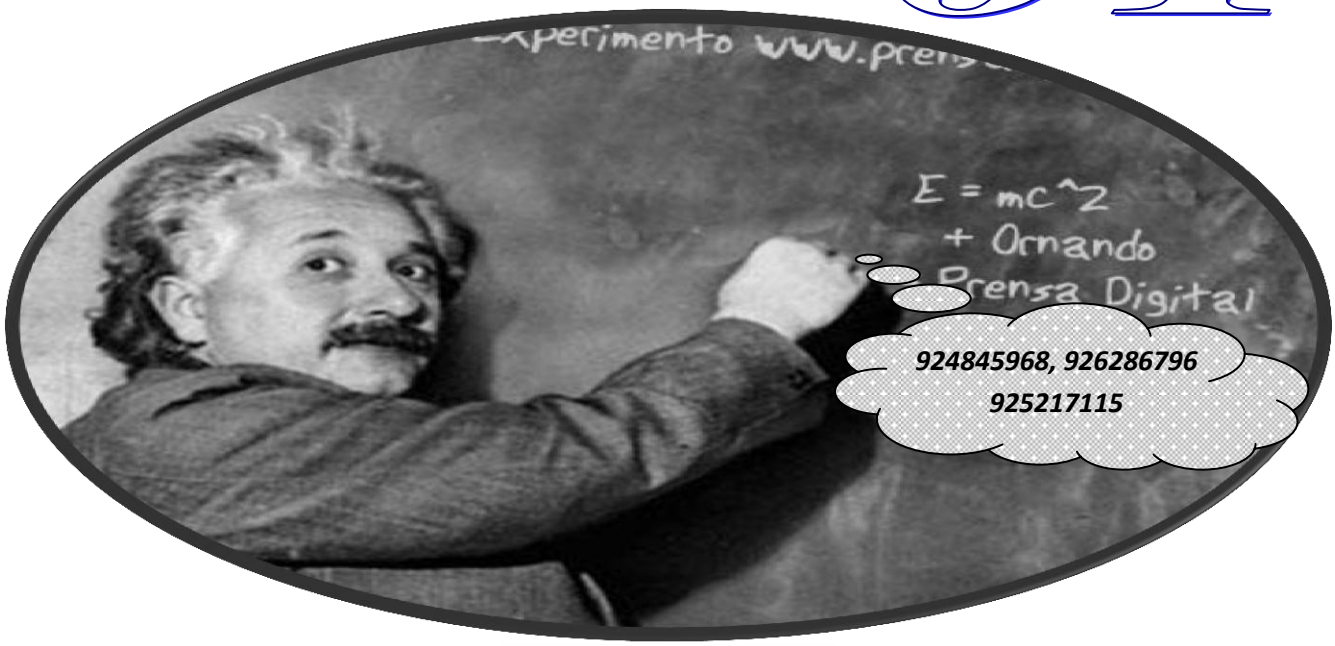
Centro de Formação Científica‘ALBERT EINSTEIN’

*( CACUACO - VILA)*

# Fascículo de Matemática

## *Parte. 01*




*Ano lectivo '2011-2012'*

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Explicador:

Turno:

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C.F.C.A.E

The Moise (M.F), The Quieto (Q.S) e The John (J.S)

# Fracções

1º) $\left[\left[\left(3-\frac{1}{2}\right)-\left(1-\frac{1}{3}\right)\right]-\left(1-\frac{4}{8}\right)+\left(2-\frac{1}{12}\right)\right.$ $R\%\frac{13}{4}$

2º) $\left[\left(16+\frac{4}{3}-\frac{1}{2}\right)-\left(7+\frac{1}{2}-\frac{1}{3}\right)\right]-\left(1-\frac{1}{2}+\frac{1}{5}\right)$ $R\%\frac{269}{30}$

3º) $1+\frac{1}{3}+\frac{3}{2}-\left[\left(\frac{5}{2}+\frac{1}{4}-1-\frac{1}{8}-\frac{5}{6}\right)-\left(2-\frac{13}{9}\right)\right]-2$ $R\%\frac{43}{72}$

4º) $\left(1+\frac{2}{7}\right)+\left[\frac{6}{7}-\left(1+\frac{3}{7}-\frac{17}{14}\right)-\left(1-\frac{29}{42}\right)\right]-\left(1-\frac{1}{6}\right)$ $R\%\frac{11}{14}$

5º) $\left[\left(\frac{3}{4}+\frac{2}{3}+\frac{16}{20}+1-\frac{1}{6}\right)-\left(\frac{30}{40}+\frac{20}{30}+\frac{10}{12}-\frac{1}{5}-\frac{6}{10}\right)\right]$-1 $R\%\frac{2}{3}$

6º) $\left(\frac{4}{3}+1-\frac{2}{6}\right)+\left(3+\frac{1}{4}\right)\times\left[\left(8+\frac{1}{2}\right)-\left(2+\frac{1}{5}\right)\right]$ $R\%\frac{899}{40}$

7º) $2-\left[\frac{5}{2}-\left(1-\frac{2}{3}\right)+\left(-3-\frac{1}{3}\right)\right]-\left(2-\frac{1}{3}+\frac{4}{5}\right)$ $R\%\frac{7}{10}$

8º) $\left[\left(\frac{3}{5}-\frac{2}{3}\right)+\left(2+\frac{13}{11}\right)\right]\div\left[\left(2+\frac{4}{5}\right)\left(\frac{4}{3}-\frac{1}{2}\right)\right]$ $R\%1$

9º) $\left[\frac{59}{10}-\left(1+\frac{7}{5}\right)+\frac{3}{2}\right]\div\left[\left(1+\frac{1}{9}\right)-\frac{2}{3}\right]-\left(2+\frac{2}{3}\right)\left(4+\frac{1}{4}\right)$ $R\%\frac{4}{3}$

10º) $\left(\frac{7}{6}-\frac{4}{6}+\frac{3}{4}\right)\left(\frac{7}{6}-\frac{4}{6}+\frac{3}{4}\right)-\left(1+\frac{1}{4}\right)\left(1+\frac{1}{4}\right)$ $R\%0$

11º) $\left(2-\frac{1}{4}+\frac{3}{4}\right)\left(\frac{5}{6}-\frac{1}{2}+\frac{3}{5}\right)+\frac{1}{9}\left(2-\frac{1}{5}\right)$ $R\%\frac{86}{45}$

12º) $\left(9-\frac{5}{2}\right)+\left\{\left(\frac{1}{2}+\frac{3}{18}\right)+\left[\left(2-\frac{1}{5}\right)-\left(\frac{2}{3}+1\right)+\frac{9}{10}\right]-\left(1-\frac{7}{10}\right)\right\}$ $R\%10$

13º) $1+\frac{1}{5}+\frac{1}{2}\left(2-\frac{2}{5}\right)-\left(4-\frac{14}{4}\right)\left(\frac{1}{3}+\frac{4}{6}\right)4$ $R\%0$

14º) $\left(1+\frac{3}{4}+\frac{5}{6}-\frac{3}{8}\right)\div\left(1+\frac{2}{3}+\frac{2}{3}\right)-\left(1-\frac{1}{2}\right)\left(1-\frac{1}{2}\right)$ $R\%\frac{5}{16}$

15º) $\frac{3}{2}-\left\{2-\left[\frac{1}{2}+\left(1-\frac{1}{2}\right)\right]+3\right\}+1$ $R\%-\frac{3}{2}$

16º) $\left\{6-\left[\frac{1}{2}-\left(1-\frac{1}{3}-\frac{2}{3}\right)-\left(\frac{2}{3}-\frac{3}{2}\right)\right]+\frac{1}{2}\right\}-\left\{1-\left[1-\left(1-\frac{1}{2}\right)\right]\right\}$ $R\%\frac{19}{3}$

17º) $\left[\left(\frac{15}{7}-1\right)\div\left(\frac{1}{7}-1\right)\right]\left[-\frac{2}{3}\div\left(0{,}1-\frac{1}{2}\right)8\right]$ $R\%-\frac{15}{18}$

18º) $\left[-\frac{2}{3}\div\left(\frac{1}{2}-\frac{4}{9}+\frac{5}{6}\right)+\left(1-\frac{7}{12}\right)\left(\frac{5}{3}-1+\frac{1}{3}\right)\right]\left(-\frac{7}{9}\right)$ $R\%\frac{7}{27}$

19º) $\frac{1}{2}\left(1-\frac{3}{5}\right)-\left[\frac{1}{6}\div\left(\frac{1}{2}-\frac{1}{3}\right)+\frac{1}{10}\right]\div\left(\frac{2}{3}+10,(3)\right)$ $R\%\frac{1}{10}$

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20º) $\left(\frac{1}{2}-1-\frac{3}{4}\right)\div\left\{-0{,}75\left[-\left(\frac{1}{4}-0{,}5\right)\right]\right\}+(3+0{,}(3))\times(-2)$ $R\%0$

21º) $\frac{3}{2}\div\left(-\frac{2}{3}+1\right)-\left\{2\div\left[\left(1-\frac{1}{2}\right)\div\left(-\frac{1}{2}\right)\right]+2\right\}$ $R\%\frac{9}{2}$

22º) $\left(-\frac{3}{4}+1{,}5-\frac{2}{3}\right)\times\frac{8}{3}+\left(-\frac{8}{11}\right)(-3+0{,}75+5)-\frac{5}{3}\left(\frac{5}{2}-\frac{1}{3}\right)$ $R\%-\frac{47}{18}$

23º) $\left(-3+\frac{5}{2}\right)\left[-\left(1-\frac{9}{23}\right)\left(0{,}75+\frac{13}{8}\right)-\left(1-\frac{1}{23}\right)\left(\frac{7}{2}+1\right)\right]\times\frac{8}{13}$ $R\%-1$

24º) $0{,}2\left\{0{,}5+\left[0,\overline{3}-1-\left(\frac{7}{11}-0,\overline{63}\right)+\frac{2}{3}\right]\left(-\frac{1}{3}+0{,}4\right)-\frac{1}{3}\right\}$ $R\%\frac{1}{30}$

25º) $\left(\frac{18}{20}-\frac{43}{5}\right)\frac{5}{8}-32\div\left(1-\frac{5}{4}\right)+\left(3-\frac{4}{5}\right)+\left(3-\frac{4}{5}+\frac{9}{10}+2\right)\frac{5}{4}$ $R\%\frac{2037}{16}$

26º) $\left(3+\frac{1}{3}+\frac{8}{-3}\right)\left(1+\frac{4}{-4}\right)+\left[\left(4+\frac{1}{2}\right)\div\left(2+\frac{1}{4}\right)-\frac{1}{2}\right]\div\left(\frac{1}{4}+\frac{1}{2}\right)$ $R\%2$

27º) $\frac{17}{12}+\left\{\frac{1}{3}-\left[\frac{3}{4}+\frac{2}{5}\left(\frac{3}{2}+1\right)-\frac{1}{4}\right]\left(1-\frac{1}{2}\right)\right\}$ $R\%1$

28º) $\dfrac{\left(11\frac{11}{18}+1\frac{19}{24}\right)\frac{16}{49}}{37\frac{1}{5}\div\left(\frac{17}{40}+0{,}6-0{,}005\right)1{,}7}$

29º) $\left(2-\frac{3}{2}+\frac{1}{5}\right)\left[1+\frac{1}{7}\left(3+\frac{10}{11}\right)\right]\left(1-\frac{3}{4}+\frac{2}{3}\right)$ $R\%1$

30º) $\left[\left(3+\frac{1}{4}\right)\left(2+\frac{5}{4}\right)+\left(3-\frac{1}{4}\right)\left(2+\frac{3}{4}\right)-\frac{2}{16}\right]\left(\frac{1}{27}+\frac{1}{9}\right)\left(1-\frac{5}{8}\right)$ $R\%1$

31º) $\left[60\left(1-\frac{1}{6}-\frac{1}{4}\right)\right]\left\{\left(-1-\frac{3}{2}\right)\left(2+\frac{4}{5}\right)\left[1-\left(\frac{3}{4}+\frac{1}{7}\right)\right]\right\}$ $R\%-\frac{315}{2}$

32º) $\left(\frac{2}{3}-\frac{3}{2}\right)\left\{\left[2+\frac{1}{3}-\left(-\frac{2}{3}-\frac{7}{2}\right)\right]\left[1-\left(\frac{1}{13}+\frac{1}{2}\right)\right]\right\}+2$ $R\%-\frac{7}{24}$

33º) $\left[1-\left(\frac{1}{2}-1\right)\left(1-\frac{1}{2}\right)\right]\left(\frac{1}{4}-1\right)\left(1-\frac{1}{4}\right)-\frac{1}{2}\left(2-\frac{15}{8}\right)\left(4+\frac{3}{4}\right)$ $R\%-1$

34º) $\left\{\left(\frac{3}{8}-\frac{1}{2}\right)\left(\frac{5}{4}-2\right)-\left(2-\frac{3}{4}\right)\left(2+\frac{3}{4}\right)-\frac{1}{2}\left[1+\frac{1}{4}\left(\pm\frac{3}{4}\right)\right]\right\}\left[\frac{1}{3}+1+\right.$
$\left.+\frac{1}{16}-\left(1--\frac{2}{5}\right)\right]$ $R\%$

35º) $\left\{\frac{1}{3}+\frac{1}{2}\left[\frac{1}{2}-\frac{1}{3}\left(\frac{1}{3}-\frac{1}{4}\right)\frac{1}{4}\left(\frac{1}{2}-\frac{1}{3}\right)\right]\left(2-\frac{26}{31}\right)\right\}-\frac{1}{2}\left(3-\frac{1}{6}\right)$ $R\%-\frac{5}{6}$

36º) $\left(\frac{2}{9}-0,\overline{3}\right)\left(\frac{7}{6}-3\right)\left[\frac{1}{3}+\frac{1}{2}-\left(\frac{2}{3}-1\right)\right]\left(2-\frac{16}{11}\right)+\left(1-\frac{8}{9}\right)\left(9-\frac{7}{6}\right)$ $R\%1$

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37º) $\left[\left(\frac{3}{2}+\frac{2}{5}\right)-\left(\frac{1}{2}+1+\frac{2}{5}\right)\right]\left[\left(\frac{1}{4}-\frac{1}{3}\right)0{,}5\right]\left(1-\frac{1}{21}\right)+\left\{-\frac{1}{2}-\left[\left(\frac{1}{3}+\frac{1}{2}\right)+\right.\right.$
$\left.\left.+1\right]\right\}\left(\frac{1}{2}++1\right)$ $R\%\frac{1}{6}$

38º) $\left(\frac{\frac{5}{3}-2}{\frac{1}{6}-1}\div\frac{\frac{1}{4}-1}{\frac{5}{2}-3}-\frac{4}{15}\right)\div\left\{-\frac{8}{3}-\left[0{,}25\div\left(-2+\frac{1}{2}\right)+5\right]\div[-0,\bar{3}]\right\}\times\frac{14}{8}$ $R\%0$

39º) $\left(\frac{\frac{3}{2}+1}{0{,}8}-\frac{3-0{,}25-\frac{5}{2}}{0{,}5+\frac{7}{8}-\frac{1}{4}}-\frac{\frac{2}{3}-1}{\frac{1}{3}-1}\right)\div\frac{173}{72}$ $R\%1$

40º) $\dfrac{\frac{1}{\frac{1}{3}-\frac{2}{4}}-\frac{2}{\frac{2}{3}-\frac{3}{4}}}{12-\frac{5}{3}+\frac{1}{\frac{4}{2}}}$ $R\%\frac{432}{251}$

41º) $\dfrac{\left\{1-\frac{1}{2}-\left[2-\frac{3}{2}\left(\frac{1}{2}-1\right)\right]\right\}\left(3-\frac{1}{7}\right)}{\left\{1-\frac{3}{4}-\left[\frac{5}{4}-1-\left(\frac{1}{4}-1\right)\right]\right\}\left(2+\frac{6}{7}\right)}$ $R\%3$

42º) $\dfrac{\frac{-2-(-3)}{-2+(-3)}+\frac{-3+(5)}{-4-(-2)}+\frac{-5-(-2)}{-1+(-2)}}{\frac{-1}{2}+\frac{1}{-3}-\frac{1}{5}}$ $R\%\frac{6}{31}$

43º) $\dfrac{\left[\frac{5}{3}\times\frac{9}{4}-\frac{15}{4}\left(\frac{5}{3}\times\frac{1}{25}-\frac{3}{5}\times\frac{1}{9}\right)\right]\times\frac{4}{5}-\frac{4}{5}}{\left(17+\frac{1}{2}\right)\div\left(3+\frac{1}{2}\right)}\times\frac{25}{11}$ $R\%1$

44º) $\dfrac{\left(3-\frac{23}{8}\right)+\left(1+\frac{1}{5}\right)\times\left(2-\frac{1}{3}\right)}{3-\frac{3}{4}\times\left(\frac{1}{3}\times\frac{9}{5}\right)}\div\dfrac{\left(1+\frac{7}{8}\right)+\left(\frac{8}{5}-\frac{27}{20}\right)}{\left(\frac{3}{4}-\frac{1}{2}\right)\times\left(1+\frac{3}{5}\right)}\div\left(2-\frac{9}{7}\right)\times\frac{5}{7}$ $R\%1$

45º) $\dfrac{2+\frac{1}{2+\frac{1}{2}}}{\frac{\frac{2}{3}-\frac{1}{6}+\frac{3}{4}}{\frac{25}{36}}}+\frac{1}{\frac{1}{52}}-\dfrac{\left(5-\frac{2}{7}\right)\left(4+\frac{7}{3}\right)}{\left(\frac{3}{4}-\frac{1}{2}\right)\left(1-\frac{5}{7}\right)}-\frac{\frac{6}{8}-\frac{1}{4}}{6}$ R%

46º) $\dfrac{\left(\frac{1+\frac{1}{2}}{1-\frac{1}{2}}-\frac{1-\frac{1}{2}}{1+\frac{1}{2}}\right)\times\frac{1}{4}}{\left(\frac{1+\frac{1}{2}}{1-\frac{1}{2}}-1\right)\times\left(1-\frac{1}{1+\frac{1}{2}}\right)}-\dfrac{4}{2+\frac{7+\frac{1}{3}}{1+\frac{3}{8}}}+\dfrac{\frac{25}{4}}{3}-\frac{31}{44}$ $R\%1$

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47º) $\left[\frac{4}{2+\frac{6+\frac{4}{3}}{1+\frac{3}{8}}}+\frac{1}{2-\frac{3}{2}}\times\frac{\frac{1}{3}}{\frac{1}{2}}-\frac{40}{33}\right]\times\frac{\left(5+\frac{1}{3}\right)\times\frac{1}{6}}{\frac{1}{3}+\frac{1}{6}}$ $R\%\ \frac{32}{33}$

48º) $\frac{1}{3+\frac{1}{5+\frac{1}{7+\frac{1}{9}}}}$; $5+\frac{1}{1+\frac{1}{51+\frac{1}{1+\frac{1}{11}}}}$; $2+\frac{1}{2+\frac{1}{4+\frac{1}{6+\frac{1}{8}}}}$

49º) $\frac{\left[\left(\frac{1}{3}-\frac{1}{5}\right)\left(-2+\frac{3}{7}\right)\left(7+\frac{35}{2}\right)+\frac{1}{3}\right]\left(\frac{1}{2}+\frac{1}{8}\right)-\left(1-\frac{1}{3}\right)}{\left(\frac{1}{3}-\frac{1}{8}\right)\left[\frac{13}{3}-\frac{5}{2}+\left(-\frac{1}{3}\right)\left(\frac{1}{5}-\frac{1}{8}\right)\left(\frac{1}{3}-\frac{1}{7}\right)(40)+\frac{7}{3}\right]}$ $R\%\ \frac{44}{15}$

50º) $\frac{\frac{3}{8}+\left[\left(\frac{12}{5}+\frac{1}{3}-\frac{3}{2}\right)\left(\frac{1}{2}+\frac{1}{37}\right)+\frac{7}{10}\right]\left(\frac{11}{9}-\frac{3}{2}\right)}{\left\{\left[\left(\frac{16}{5}-\frac{3}{2}\right)-\left(\frac{4}{2}-1\right)\right]\left(-\frac{6}{41}\right)+\left(\frac{1}{2}+\frac{1}{8}\right)\right\}\times\left(-\frac{23}{17}-1\right)}$ $R\%0$

51º) $\frac{\frac{2}{3}-\frac{5}{7}}{\left(\frac{5}{7}\right)\left(-\frac{9}{4}\right)}\left[\frac{\frac{1}{3}-\frac{1}{15}}{\frac{1}{3}+\frac{1}{15}}\div\frac{\frac{1}{10}-\frac{1}{8}}{\frac{1}{10}+\frac{1}{8}}\right]$ $R\%-\frac{8}{45}$

52º) $\frac{1}{\frac{1}{\frac{4}{3}}-1}\div\left(\frac{3}{4+\frac{18}{-2}}+1\right)-10$

53º) $-\frac{3}{4}+\frac{\frac{\frac{4}{9}\left(\frac{14}{9}+\frac{4}{9}\right)}{\frac{1}{6}}}{3\left(\frac{1}{2-\frac{1}{4}}\right)}+\frac{\frac{\frac{6}{5}+\frac{1}{15}}{1+\frac{1}{3}\left(2-\frac{4}{5}\right)}\div\frac{1}{7}}{\frac{12}{5}+\frac{1}{30}\left(\frac{3}{2}+\frac{10}{4}\right)}{1+0,\overline{3}\times\frac{6}{5}}\times\frac{7}{2}}$ $R\%\ \frac{5}{4}$

54º) $\frac{1}{1+\frac{1}{1+\frac{1}{1+\frac{1}{1+\frac{1}{2}}}}}$; $\frac{1}{1+\frac{1}{2+\frac{1}{1+\frac{1}{2+\frac{1}{2}}}}}$; $\frac{1}{1+\frac{2}{2+\frac{3}{3+\frac{4}{4+\frac{5}{5+\frac{6}{6+\frac{7}{8}}}}}}}$ $R\%\ \frac{8}{13};\frac{19}{26};\frac{16687}{28673}$

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55º) $-\frac{1}{2}+\left(\frac{1}{2}+\frac{3}{4}+1\right)\left(-\frac{2}{3}\right)-\left(\frac{1}{2}+\frac{1}{3}-1\right)\frac{6}{5}+\left(1-\frac{1}{2}\right)-\frac{4}{5}$ $R\%\frac{21}{10}$

56º) $-\left(\frac{1}{3}+\frac{3}{2}-2\right)\left(-\frac{2}{3}-\frac{1}{2}+3\right)+\left(-\frac{3}{2}+1\right)(-2)+\frac{1}{36}$ $R\%\frac{4}{3}$

57º) $\left(-\frac{1}{2}\right)\left\{\left[1-\left(\frac{3}{5}+\frac{7}{12}-\frac{17}{14}\right)+\frac{3}{5}\right]\left[\left(-\frac{1}{12}+\frac{17}{16}-\frac{1}{3}\right)\left(2-\frac{2}{3}\right)\right]\right\}$ $R\%-\frac{77}{108}$

58º) $\left(-\frac{3}{5}+\frac{3}{7}\right)\left\{\left[1+\frac{1}{10}+\frac{10}{3}+\left(\frac{4}{3}-\frac{9}{2}-\frac{1}{10}\right)\right]\left[\frac{41}{8}-\left(1+\frac{3}{2}\right)\right]\right\}+0{,}01$ $R\%-\frac{11}{40}$

59º) $\frac{3}{8}+\left[\left(\frac{12}{5}+\frac{1}{3}-\frac{3}{2}\right)\left(\frac{1}{2}+\frac{1}{37}\right)+\frac{7}{10}\right]\left(\frac{11}{9}-\frac{3}{2}\right)$ $R\%0$

60º) $\left[\left(\frac{12}{7}-\frac{2}{3}\right)\left(\frac{1}{3}+\frac{1}{11}\right)+\frac{5}{9}\right]\left[\left(\frac{1}{2}-\frac{1}{3}\right)+\frac{5}{6}\right]$ $R\%0$

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# Potência

1º) $\left\{\left[\left(1+\frac{1}{2}\right)^4 \div \left(2-\frac{1}{2}\right)^2\right]^3 \div \left(5-\frac{7}{2}\right)^4\right\}^3 \div \left(\frac{3}{2}\right)^5 + \frac{1}{2} \qquad R\%2$

2º) $\left\{\left[\left(5-\frac{10}{3}\right)^4 \left(\frac{5}{3}\right)^3\right] \div \left(\frac{8}{3}-1\right)^3\right\}^5 \div \left\{\left[\left(\frac{5}{3}\right)^9 \div \left(\frac{5}{3}\right)^7\right]^2 \times \left[\left(1+\frac{2}{3}\right)^6 \div \left(2-\frac{1}{3}\right)^5\right]^3\right\}^2$

3º) $\frac{\left(\frac{1}{4}+\frac{1}{2}\right)^3 \div \left(1-\frac{1}{3}\right)^3}{\left(\frac{7}{4}-1\right)^2+\frac{1}{2}+\left(\frac{2}{3}\right)^2} \times \frac{1}{\frac{1}{4}-\frac{1}{6}} - \left(\frac{3}{4}-\frac{2}{5}\times\frac{1}{4}\right)\times\frac{5}{4}+\frac{13}{16} \qquad R\%1$

4º) $\frac{\left(2-\frac{3}{2}\right)^2 \div \left(1-\frac{1}{2}\right)^2}{\left[\left(\frac{3}{2}-1\right)\times\left(\frac{2}{3}\right)^3+\frac{5}{27}\right]^3 \div \left(1-\frac{2}{3}\right)^2} - \frac{\frac{5}{3}\div\left(\frac{2}{3}+\frac{1}{6}\right)^2+\frac{3}{4}}{3-\frac{2}{3}\div\left(2-\frac{2}{3}\right)^2} \qquad R\%\frac{6}{5}$

5º) $\left[\frac{\left(\frac{5}{4}+\frac{1}{3}\right)^2-\left(\frac{5}{4}-\frac{1}{3}\right)^2}{1+\frac{2}{3}} \times \left(1+\frac{1}{2}\right) - \frac{\left(\frac{7}{9}+\frac{5}{2}\right)\times\left(\frac{7}{9}-\frac{5}{2}\right)}{\left(1-\frac{2}{9}\right)^2-\left(2-\frac{3}{5}\right)^2}\right]^3 \qquad R\%\frac{1}{8}$

6º) $\left(\frac{1}{2}+\frac{5}{7}\right) - \frac{\left(6-\frac{1}{2}\right)-\left(\frac{1}{2}\right)^3\times\left(\frac{2^2}{3}\right)+\left(1+\frac{2}{3}\right)^3\times\frac{3^2}{2}}{\left[1+\frac{3}{25}\div\left(\frac{1}{5}\right)^2+\frac{4}{3}\times\left(\frac{1}{2}\right)^4\right]\div\left(1+\frac{1}{6}\right)} + \frac{1}{7} \qquad R\%1$

7º) $\frac{\left[\left(\frac{1}{5}\right)^2 \div \frac{1}{25}+4+\frac{3}{2}-\frac{1}{2}\times\left(\frac{1}{3}\right)^2\times\left(1+\frac{1}{2}\right)\right]\times\frac{2}{7}}{\left[2+\frac{1}{45}\div\left(\frac{1}{3}\right)^3-\frac{7}{15}\times\frac{20}{7}\right]\div\left(\frac{24}{5}-1\right)} - \left(1+\frac{1}{2}\right) \qquad R\%4$

8º) $\frac{\left\{\left(\frac{3}{4}\times\frac{5}{4}-\frac{7}{8}\times\frac{3}{4}+1\right)\div\left[\frac{3}{4}-\left(\frac{5}{24}\times\frac{3}{5}+\frac{7}{32}\times\frac{2}{7}\right)+\frac{5}{24}\right]\right\}\div\left(1+\frac{7}{37}\times\frac{7}{2}\right)}{\left(1-\frac{2}{3}\right)\div\left(\frac{5}{3}-1\right)^3+\left(\frac{8}{75}\div\frac{4}{25}-\frac{1}{6}\right)^3\div\left(1-\frac{4}{5}\right)-\frac{7}{8}}$

9º) $\left(-\frac{1}{2}\right)^0+\left(-\frac{1}{2}\right)^1+\left(-\frac{1}{2}\right)^2+\left(-\frac{1}{2}\right)^3+\left(-\frac{1}{2}\right)^4+\left(-\frac{1}{2}\right)^5 \qquad R\%\frac{21}{32}$

10º) $\left(-\frac{1}{3}\right)^0+\left(-\frac{1}{2}\right)^1+\left(-\frac{1}{3}\right)^2+\left(-\frac{1}{2}\right)^3+\left(-\frac{1}{3}\right)^4+\left(-\frac{1}{2}\right)^5 \qquad R\%\frac{1211}{2592}$

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11º) $-\left(-\frac{1}{3}\right)^0-\left(-\frac{1}{3}\right)^1-\left(-\frac{1}{3}\right)^2-\left(-\frac{1}{3}\right)^3-\left(-\frac{1}{3}\right)^4-\left(-\frac{1}{3}\right)^5 \quad R\%-\frac{182}{243}$

12º) $\frac{(-2)+(-3)}{(-2)^2-(-3)^2}+\frac{(-2)^2-(-3)^2}{(-2)-(-3)} \quad R\%-4$

13º) $\left[\left(1+\frac{1}{2}\right)^3\div\left(-\frac{3}{2}\right)^2+\frac{1}{2}\right]^5\div\left[\left(\frac{3}{2}\right)^5\left(\frac{3}{2}\right)^3\div\left(\frac{3}{2}\right)^7+\frac{1}{2}\right]^3\times\left[\left(\frac{1}{2}\right)^2\right]^2\times\frac{1}{4}$

14º) $\frac{\left(1-\frac{1}{2}\right)^5\div\left(1-\frac{2}{3}\right)^5}{\left(2+\frac{1}{2}\right)^5}-\left(1+\frac{1}{5}+\frac{1}{6}\right)^0+\frac{\frac{1}{27}\div\left(\frac{1}{3}\right)^2+\frac{2}{3}}{\frac{1}{64}\div\left[\left(\frac{1}{2}\right)^2\right]-2^6+1}$

15º) $\{[(-4)^5\times(6)^5]^3\div[(18)^2]^3\}^2\div\{[(-9)^2]^4\div[(3)^2]^2\}\div(4^2\div3^2)^3$

16º) $\left\{\left[\frac{1}{8}\div\left(\frac{1}{2}\right)^2+\frac{3}{2}\right]^2\div\left(\frac{1}{3}\right)\right\}\times\left(-\frac{1}{6}\right)^2-\frac{\left(1-\frac{1}{5}\right)^3\times(-5)^3}{(2^2)^3} \quad R\%2$

17º) $\left\{\left[\left(-\frac{12}{5}\right)^8\div\left(\frac{4}{5}\right)^8\right]\right\}^3\div\left[(15)^3\div\left(-\frac{1}{5}\right)^5\right]^3\times\left[\left(\frac{1}{3}\right)^2\right]^6 \quad R\%$

18º) $\frac{\left(\frac{1}{2}-\frac{1}{4}\right)^3\div\left[\left(\frac{1}{2}\right)^6\right]^2}{\left(1-\frac{1}{3}\right)^5\div\left[\left(\frac{2}{3}\right)^2\right]^2\times\left(\frac{3}{2}\right)}+\frac{\left(7+\frac{1}{3}\right)^3\left(8-\frac{2}{5}\right)^5}{\left\{\left[\left(\frac{22}{3}\right)^2\right]^2\right\}^2}\div\left[\left(\frac{1}{2}\right)^3\right]^2 \quad R\%65$

19º) $\frac{\left(\frac{1}{3}\right)^3\times\frac{1}{9}\div\left(\frac{1}{3}\right)^4}{\left(1-\frac{2}{3}\right)^2\left(\frac{1}{3}\right)^2}\times\frac{\left(\frac{1}{3}\right)\left(\frac{1}{9}\right)\left(\frac{1}{27}\right)}{\left(\frac{1}{3}\right)^2\div\left(\frac{1}{3}\right)}+\left(\frac{11}{2}\right)^7\div\left[\left(\frac{11}{2}\right)^3\div\frac{121}{4}\right]^2\times\frac{11^3}{\left(\frac{1}{2}+1\right)^2\times2}$

20º) $\left(-2+\frac{1}{2}\right)^3\div\left[\left(-1-\frac{3}{4}\right)\div\left(-\frac{7}{2}\right)+\left(-\frac{1}{3}\right)^2\right]-\frac{75}{11}\div3$

21º) $\frac{2(-1)^5+\frac{1}{3}(-1)^2(1)}{(1)^2+\frac{1}{2}(-1)^6}\div(0,\overline{3})-\left(\frac{4}{3}\right)^0+(-5)^2\div3 \quad R\%4$

22º) $\frac{-2^2+\frac{1}{3}\left(\frac{1}{2}\right)^4(-2)^5}{\left(-\frac{1}{2}\right)^2-\frac{1}{2}(-2)}\times\left[-\left(-\frac{3}{2}\right)^6\div\left(-\frac{3}{2}\right)^4\right]-\frac{1}{2} \quad R\%\frac{79}{10}$

23º) $\dfrac{\frac{2}{3}\left[\frac{5}{4}\left(1-\frac{1}{5}\right)-\frac{3}{2}\right]-\left(-\frac{3}{2}\right)^{0}}{-3+\frac{2}{3}\div\left[-\frac{2}{3}+\frac{4}{5}\div\left(\frac{1}{5}-1\right)\right]+(-2)^{2}}\times\dfrac{\left(1-\frac{2}{5}\right)^{2}}{1+\left(\frac{1}{2}\right)^{5}\div\left(\frac{1}{2}\right)^{4}}$ $R\%-\frac{8}{15}$

24º) $\dfrac{\left(-\frac{1}{2}\right)^{2}+(0{,}7-0{,}8)\left[-3^{0}-\left(-\frac{1}{2}\right)^{2}\right]+(-2)\div\left(-\frac{2}{3}\right)^{2}}{\left(-2^{2}+\frac{12}{7}\right)\left[\left(\frac{1}{2}\right)^{5}\div\left(\frac{1}{2}\right)^{2}-1\right]-\left[\left(2-\frac{1}{4}\right)^{2}-\left(2+\frac{1}{4}\right)^{2}\right]}$ $R\%-\frac{33}{32}$

25º) $\dfrac{\left(1-\frac{5}{3}\right)^{3}-\left(-\frac{5}{4}+\frac{5}{6}+\frac{1}{12}+1\right)\left(\frac{4}{3}-2\right)^{2}+\left(\frac{3}{5}+\frac{9}{10}+\frac{1}{2}\right)\left(-\frac{2}{3}\right)}{\left(\frac{7}{3}-3\right)^{2}-\left(-\frac{1}{2}-\frac{1}{3}\right)\left(1-\frac{1}{3}\right)+\left(1+\frac{1}{2}\right)^{2}}$

26º) $\left\{\left[\left(-\frac{3}{7}\right)^{4}\left(-3-\frac{1}{2}\right)^{4}\right]^{3}\right\}^{2}\div\left\{\left[\left(-\frac{6}{5}\right)^{5}\left(\frac{3}{4}-2\right)^{5}\right]^{4}\left(1+\frac{1}{2}\right)^{3}\right\}-\left(\frac{1}{2}-1\right)$

27º) $\dfrac{\left\{\left[\left(\frac{2}{3}-1\right)^{2}-\left(2-\frac{16}{9}\right)\right]\left(3-\frac{7}{2}\right)+\left(1-\frac{2}{3}\right)^{2}(-3)^{2}\right\}\div\left(2-\frac{23}{18}\right)}{-3^{4}\left(2-\frac{7}{3}\right)^{2}-50\left(1-\frac{2}{5}\right)+\left(-3-\frac{1}{4}\right)(-2)^{2}}$

28º) $\left\{\left[\left(2-\frac{13}{5}\right)\left(-\frac{7}{12}\right)\left(1+\frac{11}{14}\right)\right]^{5}\div\left[\left(-\frac{3}{5}\right)\left(\frac{5}{12}-1\right)\left(2-\frac{3}{14}\right)\right]^{3}+1\right\}^{2}\div\left(\frac{5}{2}+\frac{9}{32}\right)^{2}$

29º) $0{,}22+4{,}8\left\{\left[-\frac{1}{4}+\frac{27}{28}(0{,}4\overline{3}-1)\right]^{3}\div\left(-\frac{1}{4}\right)^{4}-\frac{2}{3}\right\}+\frac{1}{3}$

30º) $\dfrac{63}{1+3(-0{,}5)^{2}}\div\left[\dfrac{\frac{1}{2}-6}{-3-2\left(-\frac{1}{2}\right)}\times\dfrac{-3\left(-\frac{1}{2}\right)^{2}-2\left(-\frac{1}{2}\right)^{3}}{1+5(-0{,}5)^{2}}\right]^{-3}$

31º) $\dfrac{\left[\left(\frac{1}{3}-\frac{1}{2}\right)^{2}\div\frac{1}{6}\right]^{3}\div\left(\frac{1}{2}-\frac{1}{3}\right)^{3}}{\left[\left(1-\frac{1}{4}\right)\left(1-\frac{1}{3}\right)\right]\div\left[-\frac{1}{2}\left(1+\frac{1}{3}\right)\right]}$ $R\%-\frac{4}{3}$

32º) $\dfrac{\left[-\left(1+\frac{1}{3}\right)(-0{,}5)^{3}(-1-0{,}5)^{2}\right]\div\left[(-0{,}5)^{3}-\left(1-\frac{5}{2}\right)\right]}{\left(\frac{9}{5}-1\right)^{2}\left[\left(-1+\frac{4}{9}\right)\left(-2+\frac{1}{2}\right)^{2}(-0{,}2)^{2}\right]}$

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33º) $\dfrac{\left\{\left[\left(1-\frac{2}{3}\right)\div\left(1-\frac{1}{6}\right)\right]^2\left(3+\frac{11}{7}\right)\right\}-\left(\frac{3}{2}-\frac{1}{4}\right)^2-\frac{1}{7}}{\left[\left(\frac{1}{2}-\frac{4}{9}+\frac{1}{6}-\frac{5}{6}+\frac{1}{3}\right)\div\left(-\frac{5}{36}\right)\right]^2\div\left(1+\frac{1}{4}\right)}$ $R\%\,\frac{1}{20}$

34º) $\left[\left(\frac{4}{3}\right)^3\div\left(\frac{3}{4}\right)^{-3}-\left(\frac{3}{4}\right)^{-4}\div\left(\frac{4}{3}\right)^4\right]\div\left[\left(\frac{11}{2}\right)^{-2}\times\left(\frac{4}{121}\right)^2-\left(\frac{17}{8}\right)^0\times\left(1-\frac{3}{5}\right)^2\right]$ $R\%0$

35º) $\dfrac{\left[\left(\frac{11}{7}-\frac{1}{9}+\frac{14}{63}\right)\div\left(\frac{11}{7}+\frac{1}{9}\right)-\frac{11}{7}\right](-3)}{\left[\left(\frac{1}{2}-\frac{1}{2}\right)^3\right]^5\div\left[\left(\frac{1}{6}\right)^7\times\left(-\frac{1}{6}\right)^5\right](-36)}$

36º) $\dfrac{\left\{\left[(3-7)^2\times4^{-2}-\frac{1}{2}\right]^3\times\left(\frac{1}{2}\right)^{-2}+\frac{1}{2}\right\}}{\frac{1}{(3^2)^{-2}}+\frac{1}{(-5)^{-3}}-\left[10\div\frac{1}{(-5)^{-1}}\right]^2+[(-2)^3]^2}^{-5}\times\left(1-\frac{1}{3}\right)^{-2}$

37º) $\left[\dfrac{\frac{1}{2}\div\left(\frac{1}{2}\right)^4-\left(\frac{1}{2}\right)^{-1}}{\left(\frac{3}{4}+\frac{1}{12}-\frac{2}{3}\right)^{-1}}-\dfrac{6\left(-\frac{1}{3}\right)^{-2}-\left(-\frac{1}{6}\right)^{-2}}{\frac{7}{4}+\frac{5}{2}+(-4)^{-1}}+\left(\frac{2}{5}\right)^{-1}\right]^{-2}$ R%1

38º) $\left\{\left[\left(-\frac{1}{3}\right)^{-3}-\left(\frac{1}{4}\right)^{-2}+\left(\frac{1}{3}\right)^{-2}-\left(-\frac{1}{5}\right)^0\right]\div6^2-(-6)^2\right\}^2\div\left(-\frac{4}{5}\right)^0$ $R\%1$

39º) $\dfrac{-\frac{3}{2}(-2)^4+5\left(-\frac{1}{3}\right)^{-2}+3^2\times2^{-2}\left(-\frac{8}{9}\right)+1}{[(-2)^4+5]-\frac{1}{3}+\frac{5}{4}\left(2+\frac{2}{5}\right)}+\dfrac{\left(-2+\frac{5}{3}\right)(-1)^2-\frac{1}{4}}{\left(-1+\frac{5}{6}\right)\left(-\frac{5}{6}\right)+\frac{3}{10}}$

40º) $\left\{\dfrac{\left[\frac{7}{3}\left(1-\frac{1}{4}\right)-0{,}75\right]^3\div\left(\frac{1}{2}-\frac{1}{5}\right)^2}{\left[\left(\frac{1}{3}\right)^3\div\left(-\frac{1}{9}\right)+\left(\frac{1}{2}-\frac{1}{6}\right)\right]\left(\frac{1}{2}+\frac{3}{5}\right)^2\div\left(\frac{1}{7}-\frac{1}{3}\right)^2-1}\right\}^{-2}$

41º) $\dfrac{\left(\frac{7}{2}-3\right)^3\div\frac{1}{7}-0.75-\left(\frac{1}{2}\right)^3}{\left(1-\frac{1}{3}\right)^3\div\left(-\frac{2}{3}\right)^2+\frac{1}{8}+\frac{19}{6}\left(-\frac{1}{2}\right)^2}$

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42º) $\dfrac{3(-1)^3+\left(\frac{1}{2}\right)^3\div\left(1-\frac{7}{8}\right)}{\left(\frac{2}{3}-1\right)^4\div\left(\frac{1}{3}\right)^2+\frac{8}{9}}-\dfrac{\left(1+\frac{3}{5}\right)^2-2^2\left(1-\frac{4}{5}\right)}{\left(\frac{1}{5}-\frac{1}{8}\right)\left(\frac{17}{2}-\frac{11}{6}\right)}$

43º) $\dfrac{\left[\left(-\frac{1}{2}\right)^5\div\left(\frac{1}{2}\right)^4-\frac{1}{2}\right]^3}{\left[\left(1+\frac{1}{2}\right)\left(1-\frac{1}{2}\right)\right]^2}\div\left(\dfrac{4^0}{3}\right)^2\div(-2)^3$

44º) $\dfrac{\left(\frac{17}{3}-\frac{23}{5}\right)\left(\frac{17}{3}+\frac{17}{5}\right)\div\left(\frac{289}{9}-\frac{529}{25}\right)}{\left(\frac{1}{2}+\frac{1}{3}\right)\left(\frac{1}{4}-\frac{1}{6}+\frac{1}{9}\right)-\frac{35}{216}}\div\dfrac{-\left(\frac{1}{3}\right)^3\div\left(\frac{1}{3}\right)^2}{\left[\left(-\frac{2}{3}\right)^3\times\left(-\frac{2}{3}\right)^2\right]^5\div\frac{2}{3}}$

45º) $\dfrac{\left[\left(\frac{1}{16}-\frac{1}{81}\right)\div\left(\frac{13}{36}\right)\right]^2\div\left(-\frac{1}{16}\right)}{\left[\left(\frac{7}{5}\right)^5\div\left(\frac{7}{5}\right)^3\right]^3\times\left(\frac{5}{7}\right)^6-1+\left(-\frac{1}{3}\right)^8\times3^7}+(2^5)^4\div(2^3)^6$

46º) $\dfrac{\dfrac{\left(\frac{1}{3}\right)^5\div\left(\frac{1}{3}\right)^2-\frac{4}{27}}{\left[\left(\frac{1}{3}\right)^3\right]^2\div\left[\left(\frac{1}{3}\right)^2\right]^2}+\dfrac{\left(\frac{7}{5}\right)^3\div\frac{7}{5}\times\left(\frac{7}{5}\right)^4}{\left[\left(\frac{7}{5}\right)^3\right]^2\div\frac{7}{5}}}{\left[\left(\frac{3^0}{2^1}-\frac{1}{3}\right)^2-\frac{1}{4}+\frac{1}{3}\right]^3\div\left[\left(\frac{1}{3}\right)^4\right]^2}\div\left\{\left(\frac{1}{5}\right)^5\div\left[\left(\frac{1}{5}\right)^2\right]^2\right\}$

47º) $\left[\left(-\frac{2}{3}\right)^5+\left(-\frac{2}{3}\right)^4\right]\div\left(-\frac{2}{3}\right)^4+\left(-1+\frac{1}{3}\right)^4\left(2-\frac{5}{3}\right)^{-5}\div\left(-\frac{2}{3}\right)^{-2}+\left(\frac{5}{27}\right)^3\div\left(\frac{4}{9}\right)^4$

48º) $\left(-\frac{3}{4}-\frac{1}{2}\right)^{-3}\times\left(-\frac{5}{4}\right)^{-2}\div\left(-\frac{5}{4}\right)^{-6}+\left(-\frac{1}{2}-\frac{1}{3}\right)^2\times\left(-\frac{5}{6}\right)^{-5}\times\left(-\frac{6}{5}\right)^{-3}+$
$+\left[\left(-1-\frac{1}{2}\right)^2\right]^{-3}\times\left(-\frac{2}{3}\right)^{-5}$

49º) $\left(\frac{2}{3}-\frac{3}{2}\right)^{-4}\times\left(\frac{2}{3}+\frac{3}{2}\right)^{-4}\left[\left(1+\frac{29}{(-6)^2}\right)^{-2}\right]^{-2}-\left(\frac{3}{4}-\frac{5}{2}\right)^{-3}\div\left(-1-\frac{3}{4}\right)^{-4}$

50º) $\left(\frac{3}{2}-\frac{1}{4}\right)^2\div\left(\frac{1}{3}+\frac{1}{9}\right)^3\left(\frac{1}{3}+\frac{1}{9}\right)^{-3}-\left(\frac{4}{3-}-\frac{5}{6}\right)^3\div\left(\frac{1}{2}-\frac{1}{6}\right)^2$

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51º) $\left[\left(-\frac{1}{4}\right)^{-2}\times\left(-\frac{1}{4}\right)^{-3}\div\left(-\frac{1}{4}\right)^{-6}\right]^{-4}\div\left[\left(-\frac{1}{7}\right)^{-2}\times\left(-\frac{7}{8}\right)^{-2}\right]^{2}\times\left[\left(\frac{1}{2}\right)^{-2}\right]^{5}$

52º) $\left\{\left[\left(\frac{5}{4}\right)^{21}-\left(\frac{5}{4}\right)^{20}\right]\div\left(\frac{5}{4}\right)^{20}\right\}\left(\frac{1}{4}\right)^{8}\div\left(\frac{1}{4}\right)^{9}+[(38^{9}\div19^{2})+3]^{2}\div7+$

$+\left\{\left[\left(\frac{4}{27}\right)^{2}\right]^{6}\div\left(\frac{4}{27}\right)^{12}\right\}$

53º) $\left\{\left[\left(1-\frac{1}{3}+\frac{1}{2}\right)\div\left(\frac{1}{6}+\frac{1}{4}\right)+\frac{1}{5}\div\frac{1}{8}\right]\div\left(4+\frac{6}{5}\right)\right\}\div\left\{\frac{2\left(2-\frac{5}{3}\right)^{3}+\left[\frac{5}{3}\left(\frac{5}{2}-\frac{1}{6}\right)\right]-\left(4-\frac{11}{3}\right)}{\left(5+\frac{8}{9}\right)}\right\}$

54º) $\left[\left(\frac{1}{6}\right)^{2}\div\left(\frac{1}{3}\right)^{2}\times\frac{3}{5}-\left(\frac{1}{2}\right)^{4}\div\left(\frac{1}{2}\right)^{3}\times\frac{1}{6}\right]\times13\div\left\{2^{3}\div2^{2}\left[\left(\frac{1}{3}\right)^{2}\div\frac{1}{3}+\frac{5^{0}}{2}-\frac{2}{5}\right]\right\}$

55º) $\left\{\left[\left(1+\frac{1}{2}\right)^{2}-\left(1-\frac{1}{3}\right)^{2}\right]\div\left(\frac{3}{2}+\frac{2}{3}\right)\right\}\div\left[\left(\frac{1}{2}+\frac{1}{3}\right)^{2}\div\left(2-\frac{7}{6}\right)^{2}\right]\div\left\{\left(1+\frac{1}{5}\right)^{2}\div\right.$

$\left.\div\left(2+\frac{2}{5}\right)^{2}\div\left[\left(2-\frac{1}{2}\right)^{2}\left(1-\frac{1}{3}\right)\right]\div3\frac{1}{2}\right\}$

56º) $\frac{\left(\frac{1}{2}\right)^{3}+\left(\frac{1}{2}\right)^{2}}{\left(\frac{1}{2}\right)^{2}-\left(\frac{1}{2}\right)^{3}}\times\frac{1}{3}+\left[2^{2^{3}}\right]+\frac{\left(\frac{1}{2}\right)^{3^{2}}+\frac{511}{512}+\left[\left(\frac{1}{2}\right)^{3}\right]^{2}}{\left(\frac{3}{2}-\frac{1}{4}\right)^{2}-\left(\frac{4}{3}-\frac{5}{6}\right)^{3}}\times\left[(-2)^{2}\left(\frac{1}{3}\right)^{3}\left(-\frac{2}{3}\right)\left(-\frac{1}{2}\right)^{2}\right]$

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# Radiciação

1º) $\sqrt{a^4b^3c^3}$

2º) $\left(\sqrt[3]{\sqrt{3}}\right)^0$

3º) $\sqrt[4]{128}$

4º) $\sqrt{a^5b^{-2}}$

5º) $\left[\left(\sqrt[3]{\sqrt{64}}\right)^3\right]^4$

6º) $\sqrt[3]{a\sqrt[3]{a}}$

7º) $\sqrt{\sqrt[4]{a^{2n+4}}}$

8º) $\left(\sqrt{5\sqrt{3}}\right)^4$

9º) $\sqrt{1800}$

10º) $\sqrt[n]{\sqrt{a^{2n}}}$

11º) $\left(a^{\sqrt{3}}\right)^{-\sqrt{3}}$

12º) $\sqrt[12]{\frac{16x^8y^{20}}{z^{12}}}$

13º) $\sqrt[3]{54x^6y^2z}$

14º) $\sqrt{28x^3y^2z}$

15º) $\sqrt[3]{a^4b^6}$

16º) $\left(-\sqrt{3}\right)^{-2}$

17º) $\sqrt{a\sqrt{a^3}}$

18º) $\sqrt[3]{ab^6c^9}$

19º) $\sqrt{a^8b^9c^{10}}$

20º) $\sqrt[3]{\sqrt{a^2b^3}}$

21º) $\sqrt{a\sqrt[n]{a^{n+2}}}$

22º) $\sqrt{2\sqrt{2\sqrt{2\sqrt{2}}}}$

23º) $\sqrt{\frac{a^3}{bc^2}}$

24º) $\sqrt[3]{a^2\sqrt{a}}$

25º) $\sqrt{2\sqrt[3]{32}}$

26º) $2\sqrt{2}-\sqrt{2}$

27º) $9\sqrt{5}-\sqrt{5}$

28º) $5\sqrt{18}+2\sqrt{2}$

29º) $7\sqrt{7}+7\sqrt{7}-7\sqrt{7}$

30º) $\sqrt[1]{5}+\left(3\sqrt{5}\right)^2$

31º) $\sqrt{a}+2\sqrt{a}-\sqrt{a}$

32º) $\sqrt{2}+5\sqrt{2}-2\sqrt{2}$

33º) $\sqrt{2}+5\sqrt{2}-2\sqrt{2}$

34º) $5\sqrt{2}+\sqrt{2}-2\sqrt{2}$

35º) $\sqrt{2}+\sqrt{8}+\sqrt{8}$

36º) $\sqrt{27}+\sqrt{48}-\sqrt{75}$

37º) $2\sqrt{3}+3\sqrt{3}-\sqrt{3}$

38º) $4\sqrt{5}+\sqrt{5}+\sqrt{5}-\sqrt{45}$

39º) $3\sqrt{18}+\sqrt{2}+\sqrt{16}$

40º) $\sqrt[3]{3}+\sqrt[3]{81}$

41º) $\sqrt[8]{16}+\sqrt[4]{4}+\sqrt[5]{32}-2\sqrt{3}$

42º) $4\sqrt[3]{2}-2\sqrt{2}+2\sqrt[3]{2}-4\sqrt[3]{0}$

43º) $\sqrt{\left[\left(\sqrt{2}\right)^2-\left(\sqrt{7}\right)^2\right]^2}$

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44º) $\sqrt{200}+\sqrt{2}-\sqrt{18}+\sqrt{72}$

45º) $\frac{\sqrt[4]{64a^6}}{\sqrt[4]{162a}}$

46º) $\sqrt[4]{3a^3}\times\sqrt{24a^5}$

47º) $\sqrt[3]{2}\times\sqrt[3]{10}\times\sqrt[3]{17}$

48º) $4\sqrt[5]{128}\div\left(8\sqrt[5]{4}\right)$

49º) $\sqrt[3]{54}\div\left(2\sqrt[3]{2}\right)\left(3\sqrt[3]{10}\right)$

50º) $\sqrt[3]{36}\div\sqrt[3]{9}\times\sqrt[3]{2}$

51º) $\sqrt[3]{x\sqrt[3]{x}}$

52º) $\frac{\sqrt[4]{6\sqrt[3]{3}}}{\sqrt[6]{6}}$

53º) $\frac{y\sqrt{y^2\sqrt{y^{-1}}}}{\sqrt{y^3}}$

54º) $\frac{\sqrt[4]{96}}{\sqrt{6}}$

55º) $\sqrt{y}\times\sqrt{2\sqrt[3]{2y}}$

56º) $\frac{\sqrt{2}\times\sqrt[3]{3}}{\sqrt[6]{12}}$

57º) $\frac{\sqrt[3]{\sqrt{y^2}}}{\sqrt[4]{y}}$

58º) $\sqrt[6]{2}\times\sqrt[9]{8}\div\left(\sqrt{8}\sqrt{32}\right)$

59º) $\sqrt[4]{2}\cdot\sqrt{10}$

60º) $\frac{\sqrt[4]{4}\cdot\sqrt[6]{49}}{\sqrt[3]{7}}$

61º) $\frac{\sqrt[3]{3}\cdot\sqrt[3]{81}}{\sqrt{27}}$

62º) $\frac{\sqrt{8}\cdot\sqrt[4]{2}-\sqrt[4]{32}}{\sqrt[4]{4}}$

63º) $\frac{\sqrt{a^3}\sqrt{b^4}}{\sqrt{ab}}$

64º) $\sqrt[4]{\frac{1}{3}\sqrt[3]{5}}$

65º) $\sqrt{\sqrt{27}\cdot\sqrt[3]{9}}$

66º) $\frac{\sqrt[3]{40}\cdot\sqrt[6]{25}}{\sqrt[3]{25}}$

67º) $\frac{\sqrt[3]{2\sqrt[2]{10}\cdot\sqrt[3]{10}}}{\sqrt{5}}$

68º) $\frac{\sqrt[3]{125}}{\sqrt{5}}$

69º) $\frac{\sqrt[4]{64a^{16}}}{\sqrt[4]{162a^8}}$

70º) $\frac{\sqrt[3]{a^2\cdot\sqrt{a\sqrt{a}}}}{\sqrt[6]{a}}$

71º) $\sqrt{a\sqrt[3]{a}}\cdot\sqrt[3]{a\sqrt{a}}$

72º) $\sqrt{3}\cdot\sqrt[4]{12}\cdot\sqrt{12}$

73º) $\left(3\sqrt[3]{3\sqrt[4]{3}}\right)^4$

74º) $\sqrt[3]{2c^2}\cdot3\sqrt[3]{bc}$

75º) $\sqrt{ab}\cdot\sqrt[3]{a^2b^2}\cdot\sqrt[4]{ab^3}$

76º) $\sqrt[4]{\sqrt{\sqrt[5]{a^{11}}}}\cdot\sqrt[10]{\sqrt{\sqrt{a^{69}}}}$

77º) $\frac{\sqrt[5]{a^3}\cdot\sqrt{a}}{\sqrt[3]{a^2}\cdot\sqrt[10]{a}}$

78º) $\sqrt{5+\sqrt{24}}\cdot\sqrt{5-\sqrt{24}}$

79º) $\frac{a\sqrt{a^{-1}\cdot\sqrt[3]{a^2}}\div\sqrt{\sqrt{\frac{1}{a}}}}{\left(\sqrt[4]{81a^2}-\sqrt{4a}\right)\cdot\left(\sqrt{a^{-1}}\right)^{-3}}$

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80º) $\sqrt[8]{\sqrt[3]{a^7}} \cdot \sqrt[6]{\sqrt[4]{a^{10}}} \cdot \sqrt{\sqrt[12]{a^7}}$

81º) $\frac{3\sqrt{2}-\frac{8\sqrt{2}\div 2}{\sqrt{8}+2\sqrt{2}}}{\sqrt[6]{8}-\sqrt{18}}$

82º) $\frac{\sqrt[3]{5}}{\sqrt{5}} \cdot \frac{a\sqrt{3a}}{\sqrt[3]{60a^2}}$

83º) $\sqrt[4]{10} \cdot \sqrt[12]{10} \cdot \sqrt[3]{15}$

84º) $\frac{\sqrt[3]{81}\div\sqrt{27}}{\sqrt[3]{3}\cdot\sqrt[3]{2}}$

85º) $\frac{\sqrt[3]{3}\cdot\sqrt[3]{8}}{3\sqrt[3]{6}}$

86º) $\sqrt{17-4\sqrt{9+4\sqrt{5}}}$

87º) $\frac{\sqrt[3]{12a^4b^5}}{\sqrt[3]{5b^2}} \cdot \frac{\sqrt[3]{45b}}{\sqrt[3]{4a}}$

88º) $\frac{3\sqrt[3]{4}\cdot 2\sqrt{2}}{\sqrt[6]{2}}$

89º) $\frac{\sqrt{20}+\sqrt{50}}{\sqrt{5}}$

90º) $\frac{18\sqrt{40}-10\sqrt{80}}{2\sqrt{10}}$

91º) $\frac{3\sqrt[3]{4}+\sqrt[3]{32}}{5\sqrt{2}}$

92º) $\frac{\sqrt[5]{16^2}}{\sqrt[10]{4}\cdot\sqrt{\sqrt[5]{4}}}$

93º) $\frac{4\sqrt{12}+3\sqrt{12}}{8\sqrt{6}}$

94º) $\sqrt[3]{a^3-a} \div \sqrt{a^2-a}$

95º) $\frac{\sqrt[3]{108}+\sqrt[3]{256}+\sqrt[3]{4}}{\sqrt[3]{\frac{4}{512}}+\sqrt[3]{\frac{4}{27}}}$

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96º) $\frac{\sqrt[3]{a\sqrt{a^{-5}}}}{\sqrt{a^{-2}\sqrt{a}}}$

97º) $\left(\frac{\sqrt{a^{-1}b\sqrt[3]{4a}}}{2a^{6}\cdot\sqrt{a^{-4}\cdot b^{2}}}\right)^{3}$

98º) $2\sqrt[4]{9}-\sqrt[3]{16}-\sqrt{48}+\sqrt[6]{256}+\sqrt{3}$

99º) $2\sqrt[3]{xy}+7\sqrt[3]{xy}+\sqrt[3]{xy}--3\sqrt[3]{xy}++9\sqrt[3]{xy}-\sqrt[3]{y}+\sqrt[3]{x}$

100º) $\frac{\sqrt{75}+\sqrt{27}}{\sqrt{75}\cdot\sqrt[3]{27}}$

101º) $\frac{2\sqrt[3]{0,1}-\sqrt[6]{10}\cdot\sqrt[6]{0,001}}{\sqrt[3]{100}}$

102º) $\sqrt[3]{128a}+\sqrt[6]{4a^{2}}-\sqrt[3]{16a}$

103º) $5\sqrt[6]{64a^{2}}-5\sqrt[3]{27a}+6\sqrt[6]{a^{3}}$

104º) $\sqrt[4]{\frac{9x^{6}}{4y^{2}}}+\sqrt[6]{\frac{27x^{9}}{8y^{3}}}-\sqrt{\frac{6x^{3}}{y}}$

105º) $\sqrt[5]{\frac{xy}{x-y}}\cdot\sqrt{\frac{x-y}{xy}}\cdot\sqrt[10]{x^{3}y^{3}}$

106º) $\sqrt[12]{\frac{4x^{2}y}{5ab^{3}}}\cdot\sqrt[8]{\frac{25a^{3}b}{2x^{4}y^{5}}}\div\sqrt[6]{\frac{4x^{2}y}{5ab}}$

107º) $\left(\sqrt[5]{\frac{xy}{x-y}}\right)\cdot\left(\sqrt{\frac{25a^{3}b}{2x^{4}y^{2}}}\div\sqrt[8]{\frac{25a^{3}b}{2x^{4}y^{2}}}\right)$

108º) $\frac{\sqrt{20}\cdot\sqrt{27}\cdot\sqrt{7}}{\sqrt{105}}$

109º) $\left(\frac{\sqrt{45}-\sqrt[3]{5\sqrt{5}}}{\sqrt{45}\div\sqrt[4]{4}}\right)\div\left(\frac{\sqrt{18}-\frac{\sqrt{18}\div\sqrt[3]{8}}{\sqrt{\sqrt{64}\cdot\sqrt{8}}}}{\sqrt[3]{2\sqrt{2}}\cdot\sqrt[3]{2}}\right)$

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110º) $\dfrac{\dfrac{\sqrt{150}\cdot\sqrt{6}\cdot\sqrt[3]{9}\cdot\sqrt{24}\cdot\sqrt[-6]{\frac{1}{9}}-\cdot\sqrt[3]{6\sqrt{6}}}{\sqrt{28-\sqrt[3]{25\cdot 2^6}+\sqrt{4\cdot 2^{12}}}}}{\left(\frac{1}{\sqrt{6}}\right)^{-1}}$

111º) $\dfrac{28-\dfrac{\sqrt[6]{2}\cdot\sqrt[3]{14}\cdot\sqrt{14}\div\sqrt[6]{49}}{\sqrt[3]{9}\cdot\sqrt[6]{9}}}{\sqrt[3]{7\sqrt{7}}+\sqrt{\frac{7}{9}}}$

112º) $\dfrac{5\sqrt[3]{2\sqrt{27}}+2\sqrt{3\sqrt[3]{4}}}{\sqrt[4]{9\sqrt[3]{16}}}$

113º) $\sqrt{\dfrac{3+\sqrt{5}}{3-\sqrt{5}}}+\sqrt{\dfrac{3-\sqrt{5}}{3+\sqrt{5}}}$

114º) $\dfrac{\sqrt{21}+\sqrt{15}}{\sqrt{21}-\sqrt{15}}-\dfrac{\sqrt{14}-\sqrt{10}}{\sqrt{14}+\sqrt{10}}$

115º) $\sqrt[3]{9\sqrt{3}-11\sqrt{2}}$

116º) $\sqrt[3]{20+\sqrt{392}}+\sqrt[3]{20-\sqrt{392}}$

117º) $\sqrt{7+4\sqrt{3}}$

118º) $\sqrt{3-2\sqrt{2}}$

119º) $\left(\sqrt{5+2\sqrt{6}}+\sqrt{5-2\sqrt{6}}\right)\cdot\frac{\sqrt{3}}{2}$

120º) $\sqrt[3]{5\sqrt{2}+7}-\sqrt[3]{5\sqrt{2}-7}$

121º) $\sqrt{3+\sqrt{5-\sqrt{13+\sqrt{48}}}}$

122º) $\left(\sqrt{32}\sqrt{45}—\sqrt{98}\right)\left(\sqrt{72-}500\sqrt{34}\sqrt{8}\right)$

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# Racionalização

1º) $\frac{1}{2\sqrt{5}}$

2º) $\frac{3}{\sqrt{3}}$

3º) $\frac{1}{\sqrt[3]{3}}$

4º) $\frac{2}{\sqrt{12}}$

5º) $\frac{2}{\sqrt[3]{6^2}}$

6º) $\frac{\sqrt{2}+\sqrt{5}}{\sqrt{2}}$

7º) $\frac{3\sqrt{2}+\sqrt{3}}{\sqrt{6}}$

8º) $\frac{\sqrt{20}-2\sqrt{10}-1}{\sqrt{5}}$

9º) $\frac{ab}{\sqrt{a}}$

10º) $\frac{\sqrt{14}+\sqrt{5}}{\sqrt{7}-\sqrt{5}}$

11º) $\frac{1}{\sqrt{3}+\sqrt{2}}$

12º) $\frac{\sqrt{2}}{2-\sqrt{2}}$

13º) $\frac{\sqrt{2}-\sqrt{5}}{\sqrt{2}+\sqrt{5}}$

14º) $\frac{6}{2\sqrt{3}-5\sqrt{2}}$

15º) $\frac{1}{\sqrt{3}+\sqrt{2}+1}$

16º) $\frac{\sqrt{5}}{2+\sqrt{3}-\sqrt{5}}$

17º) $\frac{2\sqrt{6}}{\sqrt{2}+\sqrt{3}-\sqrt{5}}$

18º) $\frac{1}{1+\sqrt{3}+\sqrt{5}+\sqrt{7}}$

19º) $\frac{1}{\sqrt{6}-\sqrt{3}+\sqrt{2}-1}$

20º) $\frac{1}{\sqrt{2-\sqrt{3}}}$

21º) $\frac{\sqrt{2}}{\sqrt{3+\sqrt{3}}}$

22º) $\frac{1}{\sqrt{5+\sqrt{41}}}$

23º) $\frac{\sqrt{1+\sqrt{15}}}{\sqrt{3-\sqrt{5}}}$

24º) $\frac{a-b}{\sqrt{a}-\sqrt{b}}$

25º) $\frac{\sqrt{2}+1}{\sqrt{2}-1}$

26º) $\frac{2xy}{\sqrt[3]{16x^2y^2}}$

27º) $\sqrt{\frac{5x^2}{8y^2}}$

28º) $\sqrt{\left(\frac{7x^2}{4y^5}\right)}$

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29º) $\frac{1}{\sqrt[5]{x}+1}$

30º) $\frac{1}{1+\sqrt{2}-\sqrt{3}}$

31º) $\frac{1}{\sqrt[4]{5}+\sqrt[4]{2}}$

32º) $\left(\sqrt[3]{15}-\sqrt[3]{7}\right)^{-1}$

33º) $\frac{1}{1+\sqrt{2}+\sqrt{3}}$

34º) $\frac{1}{\sqrt[3]{4}+\sqrt[3]{6}+\sqrt[3]{9}}$

35º) $\frac{1}{\sqrt[4]{2}+\sqrt[4]{4}+\sqrt[4]{8}+\sqrt[4]{2}}$

36º) $\frac{1}{\sqrt{14}+\sqrt{21}+\sqrt{15}+\sqrt{10}}$

37º) $\frac{2+\sqrt{6}}{2\sqrt{2}+2\sqrt{3}-\sqrt{6}-2}$

38º) $\frac{\sqrt{\sqrt{5}+\sqrt{3}}}{\sqrt{\sqrt{5}-\sqrt{3}}}$

39º) $\frac{1}{\sqrt{a}+\sqrt{a+1}}$

40º) $\frac{\sqrt{a}+1}{\sqrt{a}+\sqrt{a}+1}$

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