

ESERCIZI ASSEGNATI PER LE VACANZE NATALIZIE

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$$\begin{aligned}
 1. \quad & \left(-1 - \frac{1}{2}\right)^3 \left\{ -\frac{1}{3^2} + \left[\left(-\frac{1}{6}\right) : \left(-\frac{7}{6}\right) + \frac{6}{7} : \left(\frac{1}{2} - 1\right) - \frac{3}{7} \right] \cdot 2^{-1} \right\} = \\
 & = \left(-\frac{3}{2}\right)^3 \left\{ -\frac{1}{3^2} + \left[\frac{1}{7} + \frac{6}{7} : \left(-\frac{1}{2}\right) - \frac{3}{7} \right] \cdot 2^{-1} \right\} = \\
 & = \left(-\frac{3}{2}\right)^3 \left\{ -\frac{1}{3^2} + \left[\frac{1}{7} - \frac{12}{7} - \frac{3}{7} \right] \cdot 2^{-1} \right\} = \left(-\frac{3}{2}\right)^3 \left\{ -\frac{1}{3^2} - 2 \cdot \frac{1}{2} \right\} = \left(-\frac{3}{2}\right)^3 \left\{ -\frac{1}{9} - 1 \right\} = \\
 & = \left(-\frac{3}{2}\right)^3 \left\{ \frac{-1-9}{9} \right\} = \left(-\frac{3}{2}\right)^3 \left\{ -\frac{10}{9} \right\} = -\frac{3^3}{8} \cdot \left(-\frac{10}{3^2}\right) = \frac{15}{4}
 \end{aligned}$$

$$\begin{aligned}
 2. \quad & -2^{-2} \left\{ \left[\left(1,2 - \frac{3}{4}\right) \left(0,8 + \frac{1}{5}\right) - \frac{1}{3} : \left(\frac{7}{6} - \frac{3}{4}\right) \right] : \left(\frac{3}{5} + \frac{1}{3}\right) + (-2)^{-3} \right\} - \left(-\frac{4}{3}\right)^{-2} = \\
 & = -2^{-2} \left\{ \left[\left(\frac{9}{20}\right) (+1) - \frac{1}{3} : \left(\frac{5}{12}\right) \right] : \left(\frac{14}{15}\right) - \frac{1}{8} \right\} - \left(-\frac{3}{4}\right)^2 = \\
 & = -\frac{1}{4} \left\{ \left[\left[\frac{9}{20} - \frac{4}{5}\right] \cdot \frac{15}{14} - \frac{1}{8} \right] - \frac{9}{16} \right\} = -\frac{1}{4} \left\{ -\frac{7}{20} \cdot \frac{15}{14} - \frac{1}{8} \right\} - \frac{9}{16} = -\frac{1}{4} \left(-\frac{1}{2}\right) - \frac{9}{16} = -\frac{7}{16}
 \end{aligned}$$

$$\begin{aligned}
 3. \quad & \left\{ \left[\left(-\frac{1}{3}\right)^{-3} \right]^4 \left[\left(-\frac{1}{3}\right)^{-4} \right]^{-2} + (-3)^2 \right\} : [-5 \cdot (-3)^2] + [(-2)^3]^{-1} + \frac{1}{8} = \\
 & = \left\{ \left(-\frac{1}{3}\right)^{-12} \left(-\frac{1}{3}\right)^8 + 9 \right\} : [-5 \cdot 9] - \frac{1}{8} + \frac{1}{8} = \left\{ \left(-\frac{1}{3}\right)^{-4} + 9 \right\} : (-45) = 90 : (-45) = -2
 \end{aligned}$$

$$\begin{aligned}
 4. \quad & \left[\frac{3}{5} + \left(-\frac{2}{3}\right) \left(1 - \frac{4}{10}\right) \right] : \left[\frac{1}{5} - \frac{1}{10} \left(-\frac{2}{3}\right) : \left(-\frac{1}{3}\right)^2 \right] = \\
 & = \left[\frac{3}{5} - \frac{2}{3} \left(\frac{3}{5}\right) \right] : \left[\frac{1}{5} + \frac{1}{15} : \frac{1}{9} \right] = \left[\frac{3}{5} - \frac{2}{5} \right] : \left[\frac{1}{5} + \frac{3}{5} \right] = \frac{1}{5} : \frac{4}{5} = \frac{1}{4}
 \end{aligned}$$

$$\begin{aligned}
 5. \quad & \left(\frac{1}{6} - \frac{2}{3} + \frac{1}{4}\right) : \left[\frac{1}{3} - \frac{5}{6} - \left(-\frac{1}{2}\right)^2 \right] - \left(1 - \frac{1}{3}\right)^2 : \left(1 + \frac{1}{3}\right)^2 = \\
 & = -\frac{1}{4} : \left[\frac{1}{3} - \frac{5}{6} - \frac{1}{4} \right] - \left(\frac{2}{3}\right)^2 : \left(\frac{4}{3}\right)^2 = -\frac{1}{4} \cdot \left(-\frac{4}{3}\right) - \left(\frac{1}{2}\right)^2 = \frac{1}{3} - \frac{1}{4} = \frac{1}{12}
 \end{aligned}$$

$$8. \left[\frac{2}{5} : \frac{1}{2} \cdot \left(-\frac{5}{2} \right)^2 + 1 \right] \cdot \left(-\frac{1}{2} - \frac{2}{3} \right) \cdot \left(-2 - \frac{1}{3} \right)^{-2} =$$

$$= \left[\frac{2}{5} \cdot 2 \cdot \frac{5^2}{2^2} + 1 \right] \cdot \left(-\frac{7}{6} \right) \cdot \left(-\frac{7}{3} \right)^{-2} = [5 + 1] \cdot \left(-\frac{7}{6} \right) \cdot \frac{3^2}{7^2} = -7 \cdot \frac{3^2}{7^2} = -\frac{9}{7}$$

$$9. \left[\left(-\frac{3}{4} \right)^2 \right]^3 \cdot \left(\frac{1}{4} - 1 \right)^5 : \left[\left(-\frac{3}{4} \right)^5 \right]^2 + \{2^5 : (2^{-3} \cdot 2^6)\}^{-2} \cdot \left[\left(-\frac{1}{3} \right)^{-2} \right]^2 =$$

$$= \left(-\frac{3}{4} \right)^6 \cdot \left(-\frac{3}{4} \right)^5 : \left(-\frac{3}{4} \right)^{10} + \{2^5 : 2^3\}^{-2} \cdot \left(-\frac{1}{3} \right)^{-4} =$$

$$= -\frac{3}{4} + \{2^2\}^{-2} \cdot 3^4 = -\frac{3}{4} + \frac{81}{16} = \frac{69}{16}$$

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$$10. \text{ A: } \frac{\frac{7}{2} - \left(-\frac{1}{14} \right) \left(2 - \frac{3}{5} \right) - \frac{28}{3}}{-\frac{2}{5} - 2 + (-2) \left(-\frac{1}{6} \right)} - (-2)^3 \cdot \left(1 - \frac{34}{31} \right) =$$

$$= \frac{\frac{7}{2} + \frac{1}{14} \left(\frac{7}{5} \right) - \frac{28}{3}}{-\frac{2}{5} - 2 + \frac{1}{3}} + 8 \cdot \left(-\frac{3}{31} \right) = \frac{\frac{7}{2} + \frac{1}{10} - \frac{28}{3}}{-\frac{2}{5} - 2 + \frac{1}{3}} - \frac{24}{31} = \frac{\frac{7}{2} + \frac{1}{10} - \frac{28}{3}}{-\frac{2}{5} - 2 + \frac{1}{3}} - \frac{24}{31} = -\frac{86}{15} \cdot \left(-\frac{31}{15} \right) - \frac{24}{31} = 2$$

$$\text{B: } \frac{1}{5} : \left[\frac{1}{2} \cdot \left(-\frac{2}{5} \right)^2 \right] - \left[-\frac{1}{2} + \left(-2 - \frac{1}{2} \right)^{-1} \right] =$$

$$= \frac{1}{5} : \left[\frac{2}{25} \right] - \left[-\frac{1}{2} - \frac{2}{5} \right] = \frac{5}{2} + \frac{9}{10} = \frac{17}{5}$$

$$11. \text{ A: } \left[\frac{-\frac{1}{2} - \frac{3}{4}}{-3 + \frac{3}{4}} + \frac{-\frac{1}{2} - \frac{3}{5}}{-3 + \left(-\frac{1}{2} \right)^2} \right] \left(-1 - \frac{1}{2} \right)^2 =$$

$$= \left[\frac{-\frac{5}{4} + \frac{-11}{10}}{-\frac{9}{4} + \frac{-11}{4}} \right] \left(-\frac{3}{2} \right)^2 = \left[\frac{5}{9} + \frac{2}{5} \right] \left(-\frac{3}{2} \right)^2 = \frac{43}{45} \cdot \frac{9}{4} = \frac{43}{20}$$

$$B: \frac{\left(-\frac{4}{3}\right)^{-2} \left(3 + \frac{1}{2^{-2}}\right)}{-\left(-\frac{1}{2}\right)^2 + 5 - \frac{2}{3}} + \frac{1}{2} \cdot \left(-2 - \frac{1}{3}\right)^{-1} =$$

$$= \frac{\left(\frac{3}{4}\right)^2 (3+4)}{-\frac{1}{4} + 5 - \frac{2}{3}} + \frac{1}{2} \cdot \left(-\frac{3}{7}\right) = \frac{\frac{63}{12}}{\frac{16}{12} - \frac{3}{14}} = \frac{27}{28} - \frac{3}{14} = \frac{3}{4}$$

$$12. \frac{-\frac{4}{3} + \frac{1}{3} : \left(-\frac{1}{2}\right)^3}{-2 + \frac{1}{3}} - \frac{-\frac{3}{2} + (+2)^{-3} \left(1 + \frac{1}{3}\right)}{\left(-\frac{7}{12}\right)^2 \cdot \left(-\frac{5}{7}\right)} + \frac{108}{35} =$$

$$= \frac{-\frac{4}{3} - \frac{8}{3}}{-\frac{5}{3}} - \frac{-\frac{3}{2} + \frac{1}{8} \left(\frac{4}{3}\right)}{\left(\frac{7^2}{144}\right) \cdot \left(-\frac{5}{7}\right)} + \frac{108}{35} = 4 \cdot \frac{3}{5} - \frac{-\frac{4}{3}}{-\frac{35}{144}} + \frac{108}{35} = \frac{12}{5} - \frac{192}{35} + \frac{108}{35} = \frac{12}{5} - \frac{12}{5} = 0$$

$$13. A: \frac{-\left(2 - \frac{1}{2}\right)^{-3} - \left[\frac{2}{3} \left(1 - \frac{1}{4}\right) \left(1 + \frac{1}{5}\right)\right]^{-1}}{\left\{-2^3 \left[1 - \left(-\frac{1}{2}\right)^2 - \left(1 + \frac{1}{2}\right)^2\right] - 9\right\}^{-3}} =$$

$$= \frac{-\left(\frac{3}{2}\right)^{-3} - \left[\frac{2}{3} \left(\frac{3}{4}\right) \left(\frac{6}{5}\right)\right]^{-1}}{\left\{-2^3 \left[1 - \frac{1}{4} - \frac{9}{4}\right] - 9\right\}^{-3}} = \frac{-\frac{8}{27} - \frac{5}{3}}{\left\{-2^3 \left[-\frac{3}{2}\right] - 9\right\}^{-3}} = \frac{-\frac{53}{27}}{\{+12 - 9\}^{-3}} = -\frac{53}{27} : 3^{-3} = 53$$

$$B: -2^2 - \frac{\left(1 + \frac{2}{3}\right) [3 + (-2)^{-2}] : \left(3 - \frac{2}{5}\right)}{\left[\left(-\frac{5}{2}\right)^2\right]^{-3} : \left[\left(-\frac{2}{5}\right)^2 \left(-\frac{2}{5}\right)^3\right]}$$

$$= -2^2 - \frac{\left(\frac{5}{3}\right) \frac{13}{4} : \left(\frac{13}{5}\right)}{\left(-\frac{2}{5}\right)^6 : \left[\left(-\frac{2}{5}\right)^5\right]} = -2^2 - \frac{\frac{25}{12}}{-\frac{2}{5}} = -4 + \frac{125}{24} = \frac{29}{24}$$

$$\begin{aligned}
 16. \quad & \frac{(-3)^4 : (-3)^3 + 2^{-1} : 2}{(-3)^9 : (-3)^8 + 2^{-1}} + \frac{-3^3 : (-3)^2 + 3 : 3^{-1} + 1}{[-(-2)^{-2} : (-2)^3]^{-1}} - \left(\frac{32}{7}\right)^{-1} = \\
 & = \frac{-3 + \frac{1}{4}}{-3 + \frac{1}{2}} + \frac{-3 + 9 + 1}{[-(-2)^{-5}]^{-1}} - \frac{7}{32} = -\frac{11}{4} : \left(-\frac{5}{2}\right) + \frac{7}{32} - \frac{7}{32} = +\frac{11}{10}
 \end{aligned}$$

$$\begin{aligned}
 17. \quad & \frac{-4 \left(-\frac{2}{3}\right)^{-2} \cdot \left[\left(\frac{1}{5} - \frac{1}{6}\right) : \left(\frac{7}{30} - \frac{5}{12}\right) - \left(\frac{5}{3} - \frac{3}{2}\right) : \left(-\frac{3}{2}\right)\right]}{\left(\frac{3}{5} - \frac{1}{3}\right) \left(\frac{1}{4} - 1\right) - \left[-2^2 \left(3 - \frac{1}{2}\right) + 2 \left(3 + \frac{1}{2}\right)\right]} = \\
 & = \frac{-4 \left(\frac{9}{4}\right) \cdot \left[\left(\frac{1}{30}\right) : \left(-\frac{11}{60}\right) - \left(\frac{1}{6}\right) \cdot \left(-\frac{2}{3}\right)\right]}{\left(\frac{4}{15}\right) \left(-\frac{3}{4}\right) - \left[-4 \left(\frac{5}{2}\right) + 2 \left(\frac{7}{2}\right)\right]} = \frac{-9 \cdot \left[-\frac{2}{11} + \frac{1}{9}\right]}{-\frac{1}{5} - [-10 + 7]} = \frac{-9 \cdot \left(-\frac{7}{99}\right)}{-\frac{1}{5} + 3} = \frac{7}{11} : \frac{14}{5} = \frac{5}{22}
 \end{aligned}$$