Tema 1.11.

Ridicarea la putere a unei fracții ordinare. Reguli de calcul cu puteri

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1. a) $\left(\frac{2}{3}\right)^5 = \frac{2^5}{3^5} = \frac{32}{243}$

b) $\left(\frac{11}{14}\right)^0 = 1$

c) $\left(\frac{1}{9}\right)^3 = \frac{1^3}{9^3} = \frac{1}{729}$

d) $\left(\frac{23}{99}\right)^2 = \frac{23^2}{99^2} = \frac{529}{9801}$

e) $\left(2\frac{1}{4}\right)^3 = \left(\frac{2\cdot 4+1}{4}\right)^3 = \left(\frac{9}{4}\right)^3 = \frac{9^3}{4^3} = \frac{729}{64}$

2. a) $\left(\frac{5}{7}\right)^2 \cdot \left(\frac{5}{7}\right)^3 = \left(\frac{5}{7}\right)^{2+3} = \left(\frac{5}{7}\right)^5$

b) $\left(\frac{11}{9}\right)^{10} : \left(\frac{11}{9}\right)^7 = \left(\frac{11}{9}\right)^{10-7} = \left(\frac{11}{9}\right)^3$

c) $\left[\left(\frac{2}{13}\right)^3\right]^6 = \left(\frac{2}{13}\right)^{3\cdot 6} = \left(\frac{2}{13}\right)^{18}$

3. a) $\left(\frac{5}{4}\right)^7 : \left(\frac{5}{4}\right)^4 = \left(\frac{5}{4}\right)^{7-4} = \left(\frac{5}{4}\right)^3 = \frac{5^3}{4^3} = \frac{125}{64}$

b) $\left(\frac{21}{13}\right)^{52} : \left(\frac{21}{13}\right)^{51} = \left(\frac{21}{13}\right)^{52-51} = \left(\frac{21}{13}\right)^1 = \frac{21}{13}$

c) $\left(4\frac{1}{4}\right)^{12} : \left(4\frac{1}{4}\right)^{10} = \left(4\frac{1}{4}\right)^{12-10} = \left(4\frac{1}{4}\right)^2 = \left(\frac{4\cdot 4+1}{4}\right)^2 = \left(\frac{17}{4}\right)^2 =$

$= \frac{17^2}{4^2} = \frac{289}{16}$

d) $\left(\frac{49}{9}\right)^{18} : \left(5\frac{4}{9}\right)^{17} = \left(\frac{49}{9}\right)^{18} : \left(\frac{5\cdot 9+4}{9}\right)^{17} = \left(\frac{49}{9}\right)^{18} : \left(\frac{49}{9}\right)^{17} =$

$= \left(\frac{49}{9}\right)^{18-17} = \left(\frac{49}{9}\right)^1 = \frac{49}{9}$

e) $\left(1\frac{1}{2}\right)^{15} : \left(\frac{3}{2}\right)^{11} = \left(\frac{1\cdot 2+1}{2}\right)^{15} : \left(\frac{3}{2}\right)^{11} = \left(\frac{3}{2}\right)^{15} : \left(\frac{3}{2}\right)^{11} = \left(\frac{3}{2}\right)^{15-11} =$

$= \left(\frac{3}{2}\right)^4 = \frac{3^4}{2^4} = \frac{81}{16}$

f) $\left(4\frac{4}{15}\right)^{23} : \left(\frac{64}{15}\right)^{22} = \left(\frac{4\cdot 15+4}{15}\right)^{23} : \left(\frac{64}{15}\right)^{22} = \left(\frac{64}{15}\right)^{23} : \left(\frac{64}{15}\right)^{22} =$

$= \left(\frac{64}{15}\right)^{23-22} = \left(\frac{64}{15}\right)^1 = \frac{64}{15}$

4. a) $\left(\frac{5}{11}\right)^6 \cdot \left(\frac{11}{10}\right)^6 = \left(\frac{\cancel{5}^{1}}{\cancel{11}_{1}} \cdot \frac{\cancel{11}^{1}}{\cancel{10}_{2}}\right)^6 = \left(\frac{1}{2}\right)^6 = \frac{1^6}{2^6} = \frac{1}{64}$

b) $\left(5\frac{2}{5}\right)^4 \cdot \left(\frac{5}{9}\right)^4 = \left(5\frac{2}{5} \cdot \frac{5}{9}\right)^4 = \left(\frac{5 \cdot 5 + 2}{5} \cdot \frac{5}{9}\right)^4 = \left(\frac{\cancel{27}^{3}}{\cancel{8}_{1}} \cdot \frac{\cancel{8}^{1}}{\cancel{9}_{1}}\right)^4 = 3^4 = 81$

c) $\left(\frac{39}{54}\right)^8 \cdot \left(\frac{27}{26}\right)^8 = \left(\frac{\cancel{39}^{3}}{\cancel{54}_{2}} \cdot \frac{\cancel{27}^{1}}{\cancel{26}_{2}}\right)^8 = \left(\frac{3}{2} \cdot \frac{1}{2}\right)^8 = \left(\frac{3}{4}\right)^8 = \frac{3^8}{4^8} = \frac{6561}{65536}$

d) $\left(\frac{55}{38}\right)^3 \cdot \left(\frac{95}{22}\right)^3 = \left(\frac{\cancel{55}^{5}}{\cancel{38}_{2}} \cdot \frac{\cancel{95}^{5}}{\cancel{22}_{2}}\right)^3 = \left(\frac{5}{2} \cdot \frac{5}{2}\right)^3 = \left[\left(\frac{5}{2}\right)^2\right]^3 = \left(\frac{5}{2}\right)^6 =$

$= \frac{5^6}{2^6} = \frac{15625}{64}$

e) $\left(\frac{12}{100}\right)^9 \cdot \left(8\frac{1}{3}\right)^9 = \left(\frac{12}{100} \cdot 8\frac{1}{3}\right)^9 = \left(\frac{12}{100} \cdot \frac{8 \cdot 3 + 1}{3}\right)^9 =$

$= \left(\frac{\cancel{12}^{4}}{\cancel{100}_{4}} \cdot \frac{\cancel{25}^{1}}{\cancel{3}_{1}}\right)^9 = \left(\frac{4}{4}\right)^9 = 1^9 = 1$

f) $\left(\frac{9}{37}\right)^6 \cdot \left(\frac{37}{27}\right)^6 = \left(\frac{\cancel{9}^{1}}{\cancel{37}_{1}} \cdot \frac{\cancel{37}^{1}}{\cancel{27}_{3}}\right)^6 = \left(\frac{1}{3}\right)^6 = \frac{1^6}{3^6} = \frac{1}{729}$