

28.9.2021, kl 1b

Upraszczanie wyrażeń algebraicznych

Zadanie 1. Oblicz w pamięci (a) 9^4 , (b) 11^3 , (c) 19^3 , (d) $\frac{15^3+11^3}{15^2-11^2}$.

Zadanie 2. Oblicz

- (a) $\frac{2\frac{11}{25}-0,84\cdot\left(6\frac{8}{9}:2\frac{7}{12}-\frac{5}{12}\cdot4\frac{4}{35}\right)}{7,605:7\frac{1}{2}+3,086}$;
- (b) $\frac{\left((5,2^2:2,6+8,1)^2-6,5^2\right):0,025}{(60,192:2,4-1,08)^2-0,24\cdot1400}$;
- (c) $(\sqrt{8}-3\sqrt{2}+\sqrt{10})(\sqrt{2}+\sqrt{1,6}+3\sqrt{0,4})$;
- (d) $\left(\frac{\sqrt[6]{32}}{2\sqrt{2}-2}\right)^3 - \left(\frac{6+5\sqrt{2}}{2\sqrt{2}-2} - \frac{1}{2}(2+\sqrt{2})^2\right)$;
- (e) $\frac{1}{7\sqrt{2}-\sqrt{3}} + \frac{1}{7\sqrt{2}+\sqrt{3}}$;
- (f) $\sqrt{4+\sqrt{3}} + \sqrt{4-\sqrt{3}}$.

Zadanie 3. Usuń niewymierność z mianownika ułamka

- (a) $\frac{2}{2\sqrt{2}-1}$;
- (b) $\frac{3\sqrt{3}}{\sqrt{2}+\sqrt{3}+\sqrt{5}}$;
- (c) $\frac{1}{1+2\sqrt[3]{2}+\sqrt[3]{4}}$;
- (d) $\frac{1}{2+\sqrt[3]{2}+\sqrt[3]{4}}$;
- (e) $\frac{12}{\sqrt[3]{11}+\sqrt[3]{4}}$;
- (f) $\frac{1}{\sqrt[3]{4}+\sqrt[3]{6}+\sqrt[3]{9}}$;
- (g) $\frac{1}{\sqrt{\sqrt{2}+\sqrt[3]{3}}}$.

Zadanie 4. Uprość wyrażenie

- (a) $(2ab^2((4a^2b^3)^3:(2ab^4)^2)):(-2a^2b)^2$,
- (b) $\left(\frac{x^2}{x+y} - \frac{x^3}{x^2+2xy+y^2}\right):\left(\frac{x^2}{x^2-y^2} - \frac{x}{x+y}\right)$,
- (c) $\left(\frac{10a^2}{3+2a} - 5a\right):\frac{30a^2-15a}{8a^3+27}$,
- (d) $\left(\frac{3b}{b^2-4a^2} - \frac{2}{2a+b} + \frac{1}{2a-b}\right):\left(\frac{2b^2+8a^2}{4a^2-b^2} + 2\right)$,

$$(e) \frac{\frac{m-n}{2m-n} - \frac{m^2+n^2+m}{2m^2+mn-n^2}}{\frac{n+1}{2m-n}} \cdot (n^2 + n + mn + m) :$$

$$(f) \frac{\left(m^2 - \frac{1}{n^2}\right)^m \cdot \left(n + \frac{1}{m}\right)^{n-m}}{\left(n^2 - \frac{1}{m^2}\right)^n \cdot \left(m - \frac{1}{n}\right)^{m-n}}$$

$$(g) \frac{a^{-1}-b^{-1}}{a^{-3}+b^{-3}} : \frac{a^2b^2}{(a+b)^2-3ab} \cdot \left(\frac{a^2-b^2}{ab}\right)^{-1}$$

$$(h) \left(p \cdot \frac{p^3-2q^3}{p^3+q^3}\right)^3 + \left(q \cdot \frac{2p^3-q^3}{p^3+q^3}\right)^3 + q^3$$

$$(i) \left((\sqrt[4]{p}-\sqrt[4]{q})^{-2} + (\sqrt[4]{p}+\sqrt[4]{q})^{-2}\right) : \frac{\sqrt{p}+\sqrt{q}}{p-q}$$

$$(j) \left(\frac{\sqrt[4]{x^3}-\sqrt[4]{x}}{1-\sqrt{x}} + \frac{1+\sqrt{x}}{\sqrt[4]{x}}\right)^2 : \sqrt{1+\frac{2}{\sqrt{x}+\frac{1}{x}}}$$

Zadanie 5. Oblicz wartość wyrażeń przy zadanych wartościach

- (a) $\left(\frac{a}{b} + \frac{b}{a} - 2\right)\left(\frac{a+b}{2a} - \frac{b}{a+b}\right) : \left(a - 2b + \frac{b^2}{a}\right) : \left(\frac{a}{a+b} + \frac{b}{a-b}\right), \quad a = 0,75, b = 1\frac{1}{3}$
- (b) $\frac{\left(\frac{1}{a}+\frac{1}{b}-\frac{2c}{ab}\right)(a+b+2c)}{\frac{1}{a^2}+\frac{1}{b^2}+\frac{2}{ab}-\frac{4c^2}{a^2b^2}}, \quad a = 7,4, b = \frac{5}{37}, c = 2\frac{12}{43}$
- (c) $\frac{x^2-2x\sqrt{3}-\sqrt[3]{4+3}}{x-\sqrt{3}}, \quad x = \sqrt{3} - \sqrt[3]{2}$.

Zadanie 6. Oblicz

$$(a) \sqrt{2} \cdot \sqrt{3 + \sqrt{5 - \sqrt{13 + \sqrt{48}}}}$$

$$(b) \sqrt{2 + \sqrt{3}} \cdot \sqrt{2 + \sqrt{2 + \sqrt{3}}} \cdot \sqrt{2 + \sqrt{2 + \sqrt{2 + \sqrt{3}}}} \cdot \sqrt{2 - \sqrt{2 + \sqrt{2 + \sqrt{3}}}}$$