1. Zoraďte čísla od najmenšieho po najväčšie
   a. $(0{,}85)^{-4}; (2{,}1)^{-4}; (-0{,}9)^{-4}; (6{,}1)^{-4}; (-2{,}3)^{-4}$
   b. $3^{500}; 3^{700}; 5^{300}; 5^{500}; 5^{700}; 7^{300}; 7^{500}$
2. Vypočítajte bez použitia kalkulačky
   a. $\sqrt{0{,}0121} = \sqrt{121\cdot 10^{-4}} = \sqrt{121}\sqrt{10^{-4}} = 11\cdot 10^{-2} = 0{,}11$
   b. $\sqrt{160\,000} = \sqrt{16\cdot 10^{4}} = 4\cdot 10^{2} = 400$
   c. $\sqrt{14\,400} = 120$
   d. $\sqrt{0{,}0064} = 0{,}08$
   e. $\sqrt{\frac{6^2-11}{\frac{20}{5}}} = \sqrt{\frac{25}{4}} = \frac{5}{2}$
3. Vypočítajte

   $\sqrt{a\cdot b} = \sqrt{a}\cdot\sqrt{b}$; $\sqrt{\frac{a}{b}} = \frac{\sqrt{a}}{\sqrt{b}}$

   a. $(\sqrt{12}.\sqrt{24}):\sqrt{8} = \sqrt{\frac{12\cdot \cancel{24}^{3}}{\cancel{8}_{1}}} = \sqrt{36} = 6$
   b. $\sqrt{9+3\sqrt{3}}.\sqrt{9-3\sqrt{3}} = \sqrt{(9+3\sqrt{3})(9-3\sqrt{3})} = \sqrt{54} = \sqrt{9\cdot 6} = 3\sqrt{6}$

   $3\sqrt{3}\cdot(-3\sqrt{3}) = -9\sqrt{3}\sqrt{3} = -9\sqrt{9} = -9\cdot 3 = -27$

   c. $(\sqrt{2})^{2} + (\sqrt{8})^{2} = \sqrt{2}\sqrt{2} + \sqrt{8}\sqrt{8} = 2+8 = 10$

   $\cancel{(a+b)^2 = a^2+b^2}$!

   d.! $\left(\sqrt{5-\sqrt{3}}+\sqrt{5+\sqrt{3}}\right)^{2} = \left(\sqrt{5-\sqrt{3}}+\sqrt{5+\sqrt{3}}\right)\cdot\left(\sqrt{5-\sqrt{3}}+\sqrt{5+\sqrt{3}}\right) = 5-\cancel{\sqrt{3}} + \sqrt{(5-\sqrt{3})(5+\sqrt{3})} +$

   $+ \sqrt{(5+\sqrt{3})(5-\sqrt{3})} + 5 + \cancel{\sqrt{3}} = 10 + \sqrt{25+\cancel{5\sqrt{3}}-\cancel{5\sqrt{3}}-3} + \sqrt{\text{—}\|\text{—}} =$

   $= 10 + \sqrt{22} + \sqrt{22} = 10 + 2\sqrt{22}$

   e. $\left(\frac{\sqrt{5}+1}{2}\right)^{2000}\cdot\left(\frac{\sqrt{5}-1}{2}\right)^{2000} = \left(\frac{(\sqrt{5}+1)(\sqrt{5}-1)}{4}\right)^{2000} = \left(\frac{5-1}{4}\right)^{2000} = 1^{2000} = 1$

   $a^2\cdot b^2 = (a\cdot b)^2$

4. Vzorec $a\sqrt{b} = \sqrt{a^2 b}$ pre kladné a, b použite v „obidvoch smeroch“, aby ste daný výraz vyjadrili druhou odmocninou z jedniného prirodzeného čísla.
   a. $6\sqrt{3} = \sqrt{6^2\cdot 3} = \sqrt{36\cdot 3} = \sqrt{108}$
   ! b. $\sqrt{8}+\sqrt{2} = \sqrt{4\cdot 2} + \sqrt{2} = 2\sqrt{2} + \sqrt{2} = 3\sqrt{2} = \sqrt{3^2\cdot 2} = \sqrt{18}$
   c. $\sqrt{18}-\sqrt{8} = \sqrt{2}$
   d. $3\sqrt{7}+\sqrt{112} = 3\sqrt{7} + \sqrt{16\cdot 7} = 3\sqrt{7} + 4\sqrt{7} = 7\sqrt{7} = \sqrt{\overset{49\cdot 7}{343}}$
   e. $3\sqrt{18}+\sqrt{72} = \sqrt{450}$

5. Číselné výrazy upravte na súčet alebo rozdiely druhých odmocnín a prirodzených čísel.
   a. $\underset{\sqrt{16\cdot 5}}{\sqrt{80}} + \underset{\sqrt{25\cdot 3}}{\sqrt{75}} - \underset{\sqrt{16\cdot 3}}{\sqrt{48}} + \underset{\sqrt{25\cdot 5}}{\sqrt{125}} - \underset{\sqrt{3\cdot 9}}{\sqrt{27}} = 9\sqrt{5} - 2\sqrt{3}$ $= 4\sqrt{5} + 5\sqrt{3} - 4\sqrt{3} + 5\sqrt{5} - 3\sqrt{3}$
   b. $(\sqrt{6}-3\sqrt{3}+5\sqrt{2}-\sqrt{8}).\sqrt{6} = 6 - 3\sqrt{\overset{9\cdot 2}{18}} + 5\sqrt{\overset{4\cdot 3}{12}} - \sqrt{\overset{16\cdot 3}{48}} = 6 - 9\sqrt{2} + 10\sqrt{3} - 4\sqrt{3}$

   $= 6 - 9\sqrt{2} + 6\sqrt{3}$

   c. $(\sqrt{3}+\cancel{\sqrt{5}}+\sqrt{7}) + (\sqrt{3}-\cancel{\sqrt{5}}+\sqrt{7}) = 2\sqrt{3} + 2\sqrt{7} = 2(\sqrt{3}+\sqrt{7})$

d. $(2\sqrt{5}+5\sqrt{2})^2-(10+\sqrt{10})^2 = (2\sqrt5+5\sqrt2)(2\sqrt5+5\sqrt2)-(10+\sqrt{10})(10+\sqrt{10}) =$

$= 20+\cancel{20\sqrt{10}}+50-100-\cancel{20\sqrt{10}}-10 = -40.$

e. $\sqrt{40\,.\,15\,.\,96}-\sqrt{12\,.\,108} = \sqrt{2^3.5.3.5.2^5.3}-\sqrt{2^2.3.3^3.2^2} = \sqrt{2^8.3^2.5^2}-\sqrt{2^4.3^4} = 2^4.3.5-2^2.3^2 =$

$\sqrt{2^2.2^2.2^2.2^2}$ $2\;2\;2\;2$

$= 204.$

6. Usmernite zlomky

a. $\frac{\sqrt{2}}{1+\sqrt{2}}\cdot\frac{1-\sqrt2}{1-\sqrt2} = \frac{\sqrt2-2}{1-2} = \frac{\sqrt2-2}{-1} = 2-\sqrt2.$

b. $\frac{4}{\sqrt{5}-1}\cdot\boxed{\frac{\sqrt5+1}{\sqrt5+1}}$ 1

$\frac{}{\sqrt2}\cdot\frac{\sqrt2}{\sqrt2}$

c. $\frac{\sqrt{6}}{\sqrt{3}+\sqrt{2}}\cdot\frac{\sqrt3-\sqrt2}{\sqrt3-\sqrt2} = \frac{\sqrt{18}-\sqrt{12}}{3-2} = \overset{9.2}{\sqrt{18}}-\overset{4.3}{\sqrt{12}} = 3\sqrt2-2\sqrt3.$

?

d. $\frac{1+\sqrt{2}+\sqrt{3}}{(1+\sqrt{2})-\sqrt{3}}\cdot\frac{(1+\sqrt2+\sqrt3)}{(1+\sqrt2)+\sqrt3} = \frac{1+\sqrt2+\sqrt3+\sqrt2+2+\sqrt6+\sqrt3+\sqrt6+3}{(1+\sqrt2)(1+\sqrt2)-3} = \frac{6+2\sqrt2+2\sqrt3+2\sqrt6}{1+2\sqrt2+2-3} =$

$= \frac{\cancel{2}(3+\sqrt2+\sqrt3+\sqrt6)}{\cancel{2}\sqrt2} = \frac{3+\sqrt2+\sqrt3+\sqrt6}{\sqrt2}\cdot\frac{\sqrt2}{\sqrt2} =$

$= \frac{3\sqrt2+2+\sqrt6+2\sqrt3}{2}$

7. Porovnajte, ktoré číslo je väčšie $A=\frac{6\sqrt{5}}{\sqrt{12}}\cdot\frac{\sqrt{12}}{\sqrt{12}}$; $B=\frac{15\sqrt{2}}{\sqrt{30}}\cdot\frac{\sqrt{30}}{\sqrt{30}}$

$A=\sqrt{15} = B = \sqrt{15}$

$\frac{\cancel{15}\sqrt2\sqrt{30}}{\cancel{30}\,2} = \frac{\sqrt{60}}{2} = \sqrt{\frac{60}{4}} = \sqrt{15}$

$\sqrt{30}\cdot\sqrt{30} = \sqrt{900} = 30$

$(\sqrt{30})^2 = 30$

8. Vypočítajte

a. $\left(\frac{2}{\sqrt{3}}-1\right):\left(2-\frac{\sqrt{3}}{3}\right)$

b. $(\sqrt{7}+4).\left(\frac{21}{2\sqrt{7}}-\frac{12}{\sqrt{7}+1}\right)$

c. $(\sqrt{5})^{-4}$

d. $(2-\sqrt{2})^{-2}$

e. $(1+\sqrt{2})^{-4}.(3+2\sqrt{2})^{-3}$

9. Ako vieme usmerniť výraz $\frac{1}{\sqrt{x}-\sqrt{y}}, x>0, y>0, x\neq y$?

10. Ako vieme upraviť výraz $(\sqrt{x}+\sqrt{y})^{-1}$?