

1. Semplifica, se possibile, i seguenti radicali, supponendo non negativi tutti i fattori che eventualmente compaiono (anche nei risultati):

$\sqrt[8]{25}$	$\sqrt[8]{5^2} = \sqrt[4]{5}$	$\sqrt[18]{16}$	$\sqrt[18]{2^4} = \sqrt[9]{4}$
$\sqrt[6]{81}$	$\sqrt[6]{3^4} = \sqrt[3]{9}$	$\sqrt[4]{5^2 - 4^2}$	$\sqrt[4]{25 - 16} = \sqrt[4]{3^2} = \sqrt{3}$
$\sqrt[14]{256}$	$\sqrt[14]{2^8} = \sqrt[7]{2^4}$	$\sqrt[6]{64^5}$	$\sqrt[6]{2^{30}} = 2^5$
$\sqrt[12]{7^6 \cdot 8^4}$	$\sqrt[12]{(7 \cdot 2^2)^6} = \sqrt{28}$	$\sqrt[16]{5^{12} \cdot 7^{20}}$	$\sqrt[16]{(5^3 \cdot 7^5)^4} = \sqrt[4]{5^3 \cdot 7^5}$
$\sqrt{27^4 b^6}$	$\sqrt{(27^2 b^3)^2} = 27^2 b^3$	$\sqrt[6]{a^3 b^9}$	$\sqrt[6]{(ab^3)^3} = \sqrt{ab^3}$

2. Esegui le seguenti operazioni tra radicali e semplifica i risultati:

$\sqrt{18} \cdot \sqrt{6} \cdot \sqrt{12}$	$\sqrt{2 \cdot 3^2} \cdot \sqrt{2 \cdot 3} \cdot \sqrt{2^2 \cdot 3} = \sqrt{2^4 \cdot 3^4} = \sqrt{6^4} = 6^2 = 36$
$\sqrt[3]{3} \cdot \sqrt[3]{18}$	$\sqrt[3]{3} \cdot \sqrt[3]{2 \cdot 3^2} = \sqrt[3]{2 \cdot 3^3} = \sqrt[3]{54}$
$\sqrt{2} \cdot \sqrt{6} \cdot \sqrt{75}$	$\sqrt{2} \cdot \sqrt{2 \cdot 3} \cdot \sqrt{3 \cdot 5^2} = \sqrt{2^2 \cdot 3^2 \cdot 5^2} = \sqrt{30^2} = 30$
$\sqrt[6]{12} \cdot \sqrt[6]{2} \cdot \sqrt[6]{72}$	$\sqrt[6]{2^2 \cdot 3} \cdot \sqrt[6]{2} \cdot \sqrt[6]{2^3 \cdot 3^2} = \sqrt[6]{2^6 \cdot 3^3} = \sqrt[6]{(2^2 \cdot 3)^3} = \sqrt[6]{12^3} = \sqrt{12}$
$\sqrt[4]{\frac{7}{10}} \cdot \sqrt[4]{\frac{5}{6}} \cdot \sqrt[4]{\frac{1}{21}}$	$\sqrt[4]{\frac{7}{10} \cdot \frac{5}{6} \cdot \frac{1}{21}} = \sqrt[4]{\frac{1}{6^2}} = \sqrt{\frac{1}{6}}$
$\sqrt{\frac{2}{3}} \cdot \sqrt{\frac{6}{5}} \cdot \sqrt{\frac{5}{8}}$	$\sqrt{\frac{2}{3} \cdot \frac{6}{5} \cdot \frac{5}{8}} = \sqrt{\frac{1}{2}}$
$\sqrt[9]{\frac{5}{4}} \cdot \sqrt[9]{\frac{14}{5}} \cdot \sqrt[9]{\frac{2}{7}} \cdot \sqrt[9]{\frac{1}{8}}$	$\sqrt[9]{\frac{5}{4} \cdot \frac{14}{5} \cdot \frac{2}{7} \cdot \frac{1}{8}} = \sqrt[9]{\frac{1}{8}} = \sqrt[9]{\left(\frac{1}{2}\right)^3} = \sqrt[3]{\frac{1}{2}}$
$\sqrt[4]{3} \cdot \sqrt{3} \cdot \sqrt[3]{3}$	$\sqrt[12]{3^3 \cdot 3^6 \cdot 3^4} = \sqrt[12]{3^{13}}$
$\sqrt[15]{\frac{27a}{8b^3}} \cdot \sqrt[5]{\frac{2b}{3a}} \cdot \sqrt[3]{\frac{a}{2b}}$	$\sqrt[15]{\frac{3^3 a}{2^3 b^3}} \cdot \sqrt[5]{\frac{2b}{3a}} \cdot \sqrt[3]{\frac{a}{2b}} = \sqrt[15]{\frac{3^3 a}{2^3 b^3} \cdot \frac{2^3 b^3}{3^3 a^3} \cdot \frac{a^5}{2^5 b^5}} = \sqrt[15]{\frac{a^3}{2^5 b^5}}$
$\sqrt[8]{81} : \sqrt[5]{9}$	$\sqrt[8]{3^4} : \sqrt[5]{3^2} = \sqrt{3} : \sqrt[5]{3^2} = \sqrt[10]{3^5 : 3^4} = \sqrt[10]{3}$
$\sqrt{\frac{a^3 b}{2}} : \sqrt[4]{\frac{a^3}{4}}$	$\sqrt{\frac{a^6 b^2}{2^2}} \cdot \frac{2^2}{a^3} = \sqrt[4]{a^3 b^2}$
$\sqrt[3]{\frac{1}{2} - \frac{1}{3}} \cdot \sqrt{6} : \sqrt[6]{6}$	$\sqrt[3]{\frac{1}{6}} \cdot \sqrt{6} \cdot \sqrt[6]{\frac{1}{6}} = \sqrt[6]{\frac{1}{6^2} \cdot 6^3 \cdot \frac{1}{6}} = 1$
$\sqrt[3]{3a^2 c} : \sqrt[9]{27a}$	$\sqrt[3]{3a^2 c} : \sqrt[9]{3^3 a} = \sqrt[9]{\frac{3^3 a^6 c^3}{3^3 a}} = \sqrt[9]{a^5 c^3}$
$\sqrt[3]{a^2} : \sqrt[12]{\frac{a^6}{b^3}}$	$\sqrt[3]{a^2} \cdot \sqrt[12]{\frac{b^3}{a^6}} = \sqrt[12]{a^8 \cdot \frac{b^3}{a^6}} = \sqrt[12]{a^2 b^3}$
$\sqrt{16} : \sqrt[4]{32}$	$\sqrt{2^4} : \sqrt[4]{2^5} = \sqrt[4]{2^8} : 2^5 = \sqrt[4]{8}$

3. Semplifica le seguenti espressioni contenenti moltiplicazioni e divisioni fra radicali:

$$\sqrt[4]{1 - \frac{1}{5}} \cdot \sqrt[4]{2 + \frac{1}{2}} \cdot \sqrt[4]{\frac{8}{49}} \quad \sqrt[4]{\frac{4}{5}} \cdot \sqrt[4]{\frac{5}{2}} \cdot \sqrt[4]{\frac{8}{49}} = \sqrt[4]{\frac{2^4}{7^2}} = \sqrt[4]{\left(\frac{2^2}{7}\right)^2} = \sqrt{\frac{4}{7}}$$

$$(\sqrt[10]{32} - \sqrt[4]{3^4})(3 + \sqrt{2}) \quad (\sqrt[10]{2^5} - 3)(3 + \sqrt{2}) = (\sqrt{2} - 3)(3 + \sqrt{2}) = 2 - 9 = -7$$

$$\sqrt{\frac{8}{7}} \cdot \sqrt{\frac{14}{9}} \cdot \sqrt{\frac{9}{4}} \quad \sqrt{\frac{8}{7} \cdot \frac{14}{9} \cdot \frac{9}{4}} = \sqrt{4} = 2$$

$$\left[ \sqrt{\frac{\sqrt{75}}{\sqrt{3}}} + \left( \sqrt[4]{\frac{\sqrt{6}}{\sqrt{2}}} \right)^4 \right] \cdot (\sqrt{5} - \sqrt{3}) \quad \left[ \sqrt{\sqrt{25}} + \frac{\sqrt{6}}{\sqrt{2}} \right] \cdot (\sqrt{5} - \sqrt{3}) =$$

$$(\sqrt{5} + \sqrt{3}) \cdot (\sqrt{5} - \sqrt{3}) = 5 - 3 = 2$$

$$\sqrt[3]{\frac{a-1}{(a+2)^2}} \cdot \sqrt{\frac{a+2}{a-1}} : \sqrt[6]{\frac{a^2+4a+4}{a-1}}$$

$$\sqrt[3]{\frac{a-1}{(a+2)^2}} \cdot \sqrt{\frac{a+2}{a-1}} : \sqrt[6]{\frac{(a+2)^2}{a-1}} = \sqrt[6]{\frac{(a-1)^2}{(a+2)^4} \cdot \frac{(a+2)^3}{(a-1)^3} \cdot \frac{a-1}{(a+2)^2}} =$$

$$\sqrt[6]{\frac{1}{(a+2)^3}} = \sqrt{\frac{1}{a+2}}$$