Exercices

Attention

Chaque page comporte des "fautes"

Pose-toi la question : si tu n'as pas la même réponse : où aurais-tu fait la faute ? ;-)

H. Exercices

Série 1 : Simplification des radicaux *sous la forme* $\boxed{a\sqrt{b}}$ (actimath P 40 n° 8)

$\sqrt{12} = \sqrt{4.3} = \sqrt{2^2.3} = 2\sqrt{3}$	$\sqrt{250} = \sqrt{25.10} = \sqrt{5^2.10} = 5\sqrt{10}$
$\sqrt{18} = \sqrt{9.2} = \sqrt{3^2.2} = 3\sqrt{2}$	$\sqrt{20} = \sqrt{4.5} = \sqrt{2^2.5} = \sqrt{2^2}.\sqrt{5} = 2\sqrt{5}$
$\sqrt{50} = \sqrt{25.2} = \sqrt{5^2.2} = \sqrt{5^2}.\sqrt{2} = 5\sqrt{2}$	$\sqrt{60} = \sqrt{4.15} = \sqrt{2^2.15} = \sqrt{2^2}.\sqrt{15} = 2\sqrt{15}$
$\sqrt{75} = \sqrt{25.3} = \sqrt{5^2.3} = \sqrt{5^2}.\sqrt{3} = 5\sqrt{3}$	$\sqrt{80} = \sqrt{16.5} = \sqrt{4^2.5} = \sqrt{4^2}.\sqrt{5} = 4\sqrt{5}$
$\sqrt{8} = \sqrt{2^3} = \sqrt{2^2.2} = \sqrt{2^2}.\sqrt{2} = 2\sqrt{2}$	$\sqrt{90} = \sqrt{9.10} = \sqrt{3^2.10} = \sqrt{3^2}.\sqrt{10} = 3\sqrt{10}$
$\sqrt{27} = \sqrt{3^3} = \sqrt{3^2.3} = \sqrt{3^2}.\sqrt{3} = 3\sqrt{3}$	$\sqrt{121} = \sqrt{11^2} = 11$
$\sqrt{64} = \sqrt{8^2} = 8$	$\sqrt{242} = \sqrt{2.121} = \sqrt{11^2.2} = \sqrt{11^2}.\sqrt{2} = 11\sqrt{2}$
$\sqrt{125} = \sqrt{5^3} = \sqrt{5^2.5} = \sqrt{5^2}.\sqrt{5} = 5\sqrt{5}$	$\sqrt{225} = \sqrt{15^2} = 15$

$3\sqrt{8} = 3\sqrt{2^3} = 3\sqrt{2^2}.\sqrt{2} = 3.2\sqrt{2} = 6\sqrt{2}$	$7\sqrt{45} = 7.\sqrt{9.5} = 7\sqrt{3^2}.\sqrt{5} = 7.3\sqrt{5} = 21\sqrt{5}$
$2\sqrt{12} = 2\sqrt{2^2.3} = 2\sqrt{2^2}.\sqrt{3} = 2.2\sqrt{3} = 4\sqrt{3}$	$3\sqrt{500} = 3.\sqrt{100.5} = 3\sqrt{10^2}.\sqrt{5} = 3.10\sqrt{5} = 30\sqrt{5}$
$4\sqrt{63} = 4\sqrt{3^2.7} = 4.\sqrt{3^2}.\sqrt{7} = 4.3\sqrt{7} = 12\sqrt{7}$	$8\sqrt{72} = 8\sqrt{36.2} = 8\sqrt{6^2}.\sqrt{2} = 8.6\sqrt{2} = 48\sqrt{2}$
$5\sqrt{18} = 5\sqrt{3^2.2} = 5\sqrt{3^2}.\sqrt{2} = 5.3\sqrt{2} = 15\sqrt{2}$	$3\sqrt{200} = 3\sqrt{100.2} = 3\sqrt{10^2}.\sqrt{2} = 3.10\sqrt{2} = 30\sqrt{2}$
$6\sqrt{50} = 6.\sqrt{5^2.2} = 6.\sqrt{5^2}.\sqrt{2} = 6.5\sqrt{2} = 30\sqrt{2}$	$9\sqrt{54} = 9.\sqrt{9.6} = 9\sqrt{3^2}\sqrt{6} = 9.3\sqrt{6} = 27\sqrt{6}$
$3\sqrt{28} = 3.\sqrt{2^2.7} = 3\sqrt{2^2}.\sqrt{7} = 3.2\sqrt{7} = 6\sqrt{7}$	$7\sqrt{75} = 7.\sqrt{25.3} = 7\sqrt{5^2}.\sqrt{3} = 7.5\sqrt{3} = 35\sqrt{3}$
$5\sqrt{32} = 5\sqrt{4^2.2} = 5\sqrt{4^2}.\sqrt{2} = 5.4\sqrt{2} = 20\sqrt{2}$	$3\sqrt{128} = 3.\sqrt{64.2} = 3\sqrt{8^2}.\sqrt{2} = 3.8\sqrt{2} = 24\sqrt{2}$
$4\sqrt{27} = 4\sqrt{3^3} = 4\sqrt{3^2}\sqrt{3} = 4.3\sqrt{3} = 12\sqrt{3}$	$\sqrt{2500} = \sqrt{50^2} = 50$

$\sqrt{0{,}25} = \sqrt{0{,}5^2} = 0{,}5$	$\sqrt{0{,}75} = \sqrt{0{,}5^2}.\sqrt{3} = 0{,}5\sqrt{3}$	$\sqrt{0{,}005} = \sqrt{50.10^{-4}} = 0{,}05\sqrt{2}$
$\sqrt{0{,}04} = \sqrt{0{,}2^2} = 0{,}2$	$\sqrt{6{,}25} = \sqrt{2{,}5^2} = 2{,}5$	$\sqrt{0{,}0625} = \sqrt{0{,}25^2} = 0{,}25$

$\sqrt{2^3} = \sqrt{2^2}.\sqrt{2} = 2\sqrt{2}$	$\sqrt{5^4} = 5^2 = 25$	$\sqrt{3^7} = 3^3\sqrt{3} = 27\sqrt{3}$	$\sqrt{2^6} = 2^3 = 8$	$\sqrt{2^4.3^6} = 2^2.3^3 = 108$
$\sqrt{2^4.3} = 2^2\sqrt{3} = 4\sqrt{3}$	$\sqrt{2.3^5} = 3^2\sqrt{6} = 9\sqrt{6}$	$\sqrt{5^3.7} = 5\sqrt{35}$	$\sqrt{2^9.5} = 2^4\sqrt{10} = 16\sqrt{10}$	$\sqrt{3^3.5^5} = 3.25\sqrt{15} = 75\sqrt{15}$
$\sqrt{9^7} = \sqrt{9^6}\sqrt{9} = 9^3\sqrt{9} = 729.3 = 2187$	$\sqrt{8^5} = 8^2\sqrt{8} = 128\sqrt{2}$	$\sqrt{16^3} = 16\sqrt{16} = 16.4 = 64$	$\sqrt{25^3} = 25\sqrt{25} = 25.5 = 125$	$\sqrt{100^3} = \sqrt{10^6} = 10^3 = 1000$

Série 2 : Produit de racines carrées : réduis les expressions suivantes *sous la forme $a\sqrt{b}$*

(AM P 37 n° d colonnes 1 → 4)

$\boxed{\sqrt{a}\,\sqrt{b} = \sqrt{a.b}}$

a)	$\sqrt{2}.\sqrt{3} = \sqrt{2.3} = \sqrt{6}$	b) $3\sqrt{2}\,5\sqrt{3} = 15\sqrt{6}$	c) $(\sqrt{7})^2 = 7$	d) $\sqrt{12}\,\sqrt{3}\,\sqrt{18} = \sqrt{2^2.3.3.3^2.2} = \sqrt{2^2.3^2.3^2.2} = 18\sqrt{2}$
	$\sqrt{8}.\sqrt{2} = \sqrt{8.2} = \sqrt{16} = 4$	$3\sqrt{2}.\sqrt{2} = 3\sqrt{2^2} = 3.2 = 6$	$(2\sqrt{3})^2 = 4.3 = 12$	$2\sqrt{3}.7\sqrt{3}.\sqrt{3} = 14.3.\sqrt{3} = 42\sqrt{3}$
	$\sqrt{75}.\sqrt{50} = \sqrt{25.3.25.2} = 25\sqrt{6}$	$\sqrt{19}.\sqrt{19} = \sqrt{19^2} = 19$	$(7\sqrt{2})^2 = 49.2 = 98$	$2\sqrt{10}.5\sqrt{15} = 10\sqrt{2.5.5.3} = 10\sqrt{5^2.6} = 10.5\sqrt{6} = 50\sqrt{6}$
	$\sqrt{32}.\sqrt{18} = \sqrt{16.2^2.9} = \sqrt{16}.\sqrt{2^2}.\sqrt{9} = 4.2.3 = 24$	$5\sqrt{15}.\sqrt{15} = 5(\sqrt{15})^2 = 5.15 = 75$	$(-6\sqrt{8})^2 = 36.8 = 288$	$4\sqrt{21}.\sqrt{7} = 4\sqrt{3.7.7} = 4\sqrt{3.7^2} = 4.7\sqrt{3} = 28\sqrt{3}$
	$\sqrt{12}.\sqrt{3} = \sqrt{36} = \sqrt{6^2} = 6$	$\sqrt{42}.\sqrt{7} = \sqrt{6.7.7} = \sqrt{6.7^2} = 7\sqrt{6}$	$(-3\sqrt{5})^2 = 9.5 = 45$	$2\sqrt{5}.3\sqrt{7}.5\sqrt{105} = 30\sqrt{5.7.5.7.3} = 30\sqrt{5^2.7^2.3} = 1050\sqrt{3}$

Série 3 : Etude du produit (actimath p 41 n°11)

a)	$\sqrt{3}.\sqrt{3} = (\sqrt{3})^2 = 3$	b) $5\sqrt{6}.\sqrt{3}.3\sqrt{2} = 15\sqrt{3.2.3.2} = 15\sqrt{3^2.2^2} = 15.3.2 = 90$
	$3\sqrt{7}.\sqrt{7} = 3(\sqrt{7})^2 = 3.7 = 21$	$3\sqrt{7}.2\sqrt{14} = 2.3\sqrt{7.7.2} = 2.3\sqrt{7^2}.\sqrt{2} = 2.3.7\sqrt{2} = 3.14\sqrt{2} = 42\sqrt{2}$
	$3\sqrt{3}.\sqrt{3} = 3(\sqrt{3})^2 = 3.3 = 9$	$\sqrt{28}.\sqrt{45} = \sqrt{2^2.7.3^2.5} = 2.3\sqrt{7.5} = 6\sqrt{35}$
	$5\sqrt{11}.2\sqrt{11} = 10(\sqrt{11})^2 = 10.11 = 110$	$2\sqrt{54}.3\sqrt{8} = 6\sqrt{2.3^3.2^3} = 6\sqrt{2^4.3^2.3} = 6.2^2.3\sqrt{3} = 72\sqrt{3}$
	$2\sqrt{5}.3\sqrt{5} = 6(\sqrt{5})^2 = 6.5 = 30$	$\sqrt{12}.\sqrt{18} = \sqrt{2^2.3.2.3^2} = 2.3\sqrt{3.2} = 6\sqrt{6}$
	$\sqrt{3}.2\sqrt{3}.\sqrt{3} = 2(\sqrt{3})^2.\sqrt{3} = 2.3.\sqrt{3} = 6\sqrt{3}$	$2\sqrt{5}.\sqrt{2}.\sqrt{15} = 2\sqrt{5.2.5.3} = 2\sqrt{5^2.2.3} = 2.5\sqrt{2.3} = 10\sqrt{6}$
	$2\sqrt{7}.5\sqrt{7}.\sqrt{7} = 10(\sqrt{7})^2.\sqrt{7} = 10.7.\sqrt{7} = 70\sqrt{7}$	$5\sqrt{12}.\sqrt{24} = 5\sqrt{2^2.3.2^3.3} = 5\sqrt{2^4.2.3^2} = 5.2^2.3\sqrt{2} = 60\sqrt{2}$

(actimath p 41 n°11) suite

c) $2\sqrt{3}\,.\,\sqrt{2}\,.\,\sqrt{15} = 2\sqrt{3.2.3.5} = 2\sqrt{3^2.2.5} = 2.3\sqrt{2.5} = 6\sqrt{10}$	d) $5^3\,.\,\sqrt{5^3} = 5^3\sqrt{5^2.5} = 5^3.5\sqrt{5} = 625\sqrt{5}$
$\sqrt{52}\,.\,\sqrt{39} = \sqrt{2^2.13.3.13} = \sqrt{2^2.13^2.3} = 2.13\sqrt{3} = 26\sqrt{3}$	$\sqrt{3}\ \sqrt{3^3} = \sqrt{3^4} = 3^2 = 9$
$\sqrt{27}\,.\,\sqrt{75} = \sqrt{3^3.5^2.3} = \sqrt{3^4.5^2} = 3^2.5 = 45$	$\sqrt{7^3}\ \sqrt{7} = \sqrt{7^4} = 7^2 = 49$
$3\sqrt{5}\,.\,\sqrt{80} = 3\sqrt{400} = 3\sqrt{20^2} = 3.20 = 60$	$2\sqrt{11}\ \sqrt{11^3} = 2\sqrt{11^4} = 2.11^2 = 2.121 = 242.$
$\sqrt{300}\,.5\sqrt{200} = 5\sqrt{6.10^4} = 5.10^2\sqrt{6} = 500\sqrt{6}$	$\sqrt{2^5}\ \sqrt{2} = \sqrt{2^6} = 2^3 = 8$
$\sqrt{32}\,.3\sqrt{24}\,.\sqrt{8} = 3\sqrt{2^5.2^3.3.2^3} = 3\sqrt{2^{10}.2.3} = 3.2^5\sqrt{2.3} = 96\sqrt{6}$	$3\sqrt{5^2}\ \sqrt{5^3} = 3\sqrt{5^4.5} = 3.5^2\sqrt{5} = 75\sqrt{5}$
$\sqrt{500}\,.3\sqrt{20} = 3\sqrt{10000} = 3.100 = 300$	$2\sqrt{3^2}\,.\,5\sqrt{3^5} = 10\sqrt{3^6.3} = 10.3^3\sqrt{3} = 270\sqrt{3}$

Série 4 : <u>Effectue les multiplications suivantes :</u>

a) $\sqrt{44}\,.\,\sqrt{11}$ $= \sqrt{2^2.11.11} = \sqrt{2^2.11^2} = 2.11 = 22$	c) $\sqrt{12}\,.\,\sqrt{27}$ $= \sqrt{2^2.3.3^3} = \sqrt{2^2.3^4} = 2.3^2 = 18$	e) $5\sqrt{15}\,.\,\sqrt{125}$ $= 5\sqrt{3.5.5^3} = 5\sqrt{3.5^4} = 5.5^2\sqrt{3} = 125\sqrt{3}$	g) $(\sqrt{12} - 4)\,\sqrt{3}$ $= \sqrt{12}.\sqrt{3} - 4\sqrt{3} = \sqrt{2^2.3^2} - 4\sqrt{3} = 6 - 4\sqrt{3}$
b) $\sqrt{20}\,.\,\sqrt{15}$ $= \sqrt{2^2.5.5.3} = \sqrt{2^2.5^2.3} = 2.5\sqrt{3} = 10\sqrt{3}$	d) $\sqrt{35}\,.\,\dfrac{1}{\sqrt{35}} = 1$	f) $(2 - \sqrt{5})\,\sqrt{5}$ $= 2\sqrt{5} - \sqrt{5}.\sqrt{5} = 2\sqrt{5} - 5$	h) $-\sqrt{32}\,(\sqrt{18} - \sqrt{2})$ $= -\sqrt{2^5.2.3^2} + \sqrt{2^5.2} = -\sqrt{2^6.3^2} + \sqrt{2^6} = -2^3.3 + 2^3 = -24 + 8 = -16$

Série 5 : Etude du quotient

$\frac{\sqrt{a}}{\sqrt{b}} \sqrt{\frac{a}{b}}$

: 6

$\frac{\sqrt{20}}{\sqrt{5}} = \sqrt{\frac{20}{5}} = \sqrt{4} = 2$	$\frac{\sqrt{160}}{\sqrt{10}} = \sqrt{\frac{160}{10}} = \sqrt{16} = 4$	$\frac{\sqrt{294}}{\sqrt{54}} = \sqrt{\frac{49}{9}} = \frac{7}{3}$	$\frac{\sqrt{600}}{\sqrt{50}} = \sqrt{\frac{600}{50}} = \sqrt{12}$ $= 2\sqrt{3}$
$\frac{\sqrt{75}}{\sqrt{3}} = \sqrt{\frac{75}{3}} = \sqrt{25} = 5$	$\frac{\sqrt{150}}{\sqrt{24}} = \sqrt{\frac{150}{24}} = \sqrt{\frac{25}{4}} = \frac{5}{2}$	$\frac{\sqrt{12}}{\sqrt{6}} = \sqrt{\frac{12}{6}} = \sqrt{2}$	$\frac{\sqrt{20000}}{\sqrt{1500}}$ $\sqrt{\frac{40}{3}} = 2\sqrt{\frac{10}{3}}$
$\frac{\sqrt{28}}{\sqrt{7}} = \sqrt{\frac{28}{7}} = \sqrt{4} = 2$	$\frac{\sqrt{75}}{\sqrt{3}} =$ idem 5	$\frac{\sqrt{0,4}}{\sqrt{10}} = \sqrt{\frac{4}{100}} = \frac{2}{10}$	$\frac{\sqrt{18}}{\sqrt{2}} = \sqrt{\frac{18}{2}} = \sqrt{9} = 3$
$\sqrt{\frac{9}{16}} = \frac{3}{4}$	$\sqrt{\frac{7}{25}} = \frac{\sqrt{7}}{5}$	$\sqrt{\frac{3}{4}} = \frac{\sqrt{3}}{2}$	$\sqrt{\frac{98}{75}} = \frac{\sqrt{98}}{5\sqrt{3}} = \frac{\sqrt{2.49}}{5\sqrt{3}}$ $= \frac{7\sqrt{2}}{5\sqrt{3}}$

$98 = 2.49$
$= 2.7^2$

Série 6 : Racines carrées et termes semblables (AM p 37 n° c) :

$3\sqrt{2} + 5\sqrt{2}$ $= 8\sqrt{2}$	$\sqrt{12} + 5\sqrt{3}$ $= \sqrt{4.3} + 5\sqrt{3}$ $= 2\sqrt{3} + 5\sqrt{3}$ $= 7\sqrt{3}$	$7\sqrt{5} - 3\sqrt{5} - 6\sqrt{5} = -2\sqrt{5}$
$2\sqrt{3} - 7\sqrt{3}$ $= -5\sqrt{3}$	$2\sqrt{45} - \sqrt{20} = 2\sqrt{9.5} - \sqrt{4.5}$ $= 2.3\sqrt{5} - 2\sqrt{5}$ $= 6\sqrt{5} - 2\sqrt{5}$ $= 4\sqrt{5}$	$\sqrt{7} - 3\sqrt{7} - 2\sqrt{7} = -4\sqrt{7}$
$7\sqrt{5} + \sqrt{5}$ $= 8\sqrt{5}$	$\sqrt{18} + \sqrt{72} = \sqrt{9.2} + \sqrt{36.2}$ $= 3\sqrt{2} + 6\sqrt{2}$ $= 9\sqrt{2}$	$3\sqrt{5} - 7\sqrt{45} + 2\sqrt{20}$ $= 3\sqrt{5} - 7\sqrt{5.9} + 2\sqrt{4.5}$ $= 3\sqrt{5} - 7.3\sqrt{5} + 2.2\sqrt{5}$ $= 3\sqrt{5} - 21\sqrt{5} + 4\sqrt{5}$ $= -14\sqrt{5}$
$2\sqrt{3} + 4\sqrt{7}$ = idem $= 2\sqrt{3} + 4\sqrt{7}$	$\sqrt{98} - \sqrt{50} = \sqrt{2.49} - \sqrt{2.25}$ $= 7\sqrt{2} - 5\sqrt{2}$ $= 2\sqrt{2}$	$2\sqrt{75} - 4\sqrt{27} + 2\sqrt{48}$ $= 2\sqrt{25.3} - 4\sqrt{3^2.3} + 2\sqrt{16.3}$ $= 2.5\sqrt{3} - 4.3\sqrt{3} + 2.4\sqrt{3}$ $= 10\sqrt{3} - 12\sqrt{3} + 8\sqrt{3}$ $= 6\sqrt{3}$
$\sqrt{7} + \sqrt{7}$ $= 2\sqrt{7}$	$\sqrt{500} - 3\sqrt{45} = \sqrt{5.100} - 3\sqrt{9.5}$ $= 10\sqrt{5} - 3.3\sqrt{5}$ $= \sqrt{5}$	$\sqrt{12} + 4\sqrt{75} - 2\sqrt{16}$ $= \sqrt{2^2.3} + 4\sqrt{5^2.3} - 2\sqrt{4^2}$ $= 2\sqrt{3} + 4.5\sqrt{3} - 2.4$ $= 2\sqrt{3} + 20\sqrt{3} - 8$ $= 22\sqrt{3} - 8$

$17\sqrt{32}-5\sqrt{2}+4\sqrt{8}$ $=17\sqrt{2^5}-5\sqrt{2}+4\sqrt{2^3}$ $=17.2^2\sqrt{2}-5\sqrt{2}+4.2\sqrt{2}$ $=68\sqrt{2}-5\sqrt{2}+8\sqrt{2}=71\sqrt{2}$	$\sqrt{50}-2\sqrt{8}+3\sqrt{18}-7\sqrt{2}$ $=\sqrt{2.5^2}-2\sqrt{2^3}+3\sqrt{2.3^2}-7\sqrt{2}$ $=5\sqrt{2}-2.2\sqrt{2}+3.3\sqrt{2}-7\sqrt{2}$ $=3\sqrt{2}$
$3\sqrt{20}+4\sqrt{45}-2\sqrt{80}$ $=3\sqrt{2^2.5}+4\sqrt{3^2.5}-2\sqrt{4^2.5}$ $=3.2\sqrt{5}+4.3\sqrt{5}-2.4\sqrt{5}$ $=6\sqrt{5}+12\sqrt{5}-8\sqrt{5}=10\sqrt{5}$	$\sqrt{32}-3\sqrt{243}+\sqrt{128}-\sqrt{27}$ $=\sqrt{2^4.2}-3\sqrt{3^4.3}+\sqrt{2^6.2}-\sqrt{3^2.3}$ $=2^2\sqrt{2}-3.3^2\sqrt{3}+2^3\sqrt{2}-3\sqrt{3}$ $=4\sqrt{2}-27\sqrt{3}+8\sqrt{2}-3\sqrt{3}$ $=12\sqrt{2}-30\sqrt{3}$
$2\sqrt{3}-\sqrt{300}+3\sqrt{12}$ $=2\sqrt{3}-\sqrt{10^2.3}+3\sqrt{2^2.3}$ $=2\sqrt{3}-10\sqrt{3}+3.2\sqrt{3}$ $=2\sqrt{3}-10\sqrt{3}+6\sqrt{3}=-2\sqrt{3}$	$\sqrt{12}+\sqrt{8}-2\sqrt{2}+3\sqrt{5}$ $=\sqrt{2^2.3}+\sqrt{2^2.2}-2\sqrt{2}+3\sqrt{5}$ $=2\sqrt{3}+2\sqrt{2}-2\sqrt{2}+3\sqrt{5}$ $=2\sqrt{3}+3\sqrt{5}$
$\sqrt{40}+\sqrt{90}-\sqrt{490}$ $=\sqrt{2^2.10}+\sqrt{3^2.10}-\sqrt{7^2.10}$ $=2\sqrt{10}+3\sqrt{10}-7\sqrt{10}$ $=-2\sqrt{10}$	$2\sqrt{54}-2\sqrt{24}-\sqrt{150}+\sqrt{6}$ $=2\sqrt{3^3.2}-2\sqrt{2^3.3}-\sqrt{5^2.6}+\sqrt{6}$ $=2.3\sqrt{3.2}-2.2\sqrt{2.3}-5\sqrt{6}+\sqrt{6}$ $=6\sqrt{6}-4\sqrt{6}-5\sqrt{6}+\sqrt{6}=-2\sqrt{6}$
$\sqrt{18}+3\sqrt{27}-2\sqrt{25}$ $=\sqrt{3^2.2}+3\sqrt{3^2.3}-2\sqrt{5^2}$ $=3\sqrt{2}+3.3\sqrt{3}-2.5$ $=3\sqrt{2}+9\sqrt{3}-10$	

Exercices supplémentaires : AM p 40 n°10

Série 7 : Racines carrées, distributivité, produits remarquables et binômes conjugués

(AM p 37 n°d colonnes 5 → 8)

$\sqrt{6}(\sqrt{2}-\sqrt{3})=\sqrt{6.2}-\sqrt{6.3}$ $=\sqrt{3.2^2}-\sqrt{2.3^2}$ $=2\sqrt{3}-3\sqrt{2}$	$(\sqrt{3}+\sqrt{5})(\sqrt{6}+\sqrt{15})$ $=\sqrt{3.3.2}+\sqrt{3.3.5}+\sqrt{5.6}+\sqrt{5.5.3}$ $=\sqrt{3^2.2}+\sqrt{3^2.5}+\sqrt{5.6}+\sqrt{5^2.3}$ $=3\sqrt{2}+3\sqrt{5}+\sqrt{30}+5\sqrt{3}$
$\sqrt{5}(\sqrt{30}+\sqrt{20})=\sqrt{5.6.5}+\sqrt{5.5.4}$ $=\sqrt{5^2.6}+\sqrt{5^2.2^2}$ $=5\sqrt{6}+10$	$(2\sqrt{6}+\sqrt{2})(\sqrt{3}-4\sqrt{5})$ $=2\sqrt{2.3.3}-8\sqrt{6.5}+\sqrt{2.3}-4\sqrt{2.5}$ $=2\sqrt{2.3^2}-8\sqrt{30}+\sqrt{6}-4\sqrt{10}$ $=6\sqrt{2}-8\sqrt{30}+\sqrt{6}-4\sqrt{10}$
$(\sqrt{50}-\sqrt{27})\sqrt{5}=\sqrt{5.10.5}-\sqrt{3^2.3.5}$ $=\sqrt{5^2.10}-\sqrt{3^2.3.5}$ $=5\sqrt{10}-3\sqrt{15}$	$(\sqrt{12}-\sqrt{18})(\sqrt{3}-\sqrt{2})$ $=\sqrt{36}-\sqrt{2^2.3.2}-\sqrt{2.9.3}+\sqrt{36}$ $=6-2\sqrt{6}-9\sqrt{6}+6$ $=12-11\sqrt{6}$
$3\sqrt{2}(\sqrt{8}+\sqrt{12})=3\sqrt{16}+3\sqrt{2.2^2.3}$ $=3.4+3.2\sqrt{6}$ $=12+6\sqrt{6}$	$(3\sqrt{5}+3\sqrt{2})(2\sqrt{5}-5\sqrt{2})$ $6\sqrt{5}.\sqrt{5}-15\sqrt{5.2}+6\sqrt{5.2}-15\sqrt{2^2}$ $=6.5-15\sqrt{10}+6\sqrt{10}-15.2$ $=\quad 9\sqrt{10}$
$(2-5\sqrt{3})2\sqrt{3}=2.2\sqrt{3}-5\sqrt{3}.2\sqrt{3}$ $=4\sqrt{3}-10(\sqrt{3})^2$ $=4\sqrt{3}-10.3$ $=4\sqrt{3}-30$	$(\sqrt{45}-\sqrt{28})(3\sqrt{7}-2\sqrt{5})$ $=3\sqrt{3^2.5.7}-2\sqrt{3^2.5.5}-3\sqrt{2^2.7.7}+2\sqrt{2^2.7.5}$ $=3.3\sqrt{5.7}-2.3.5-3.2.7+2.2\sqrt{7.5}$ $=9\sqrt{35}-30-42+4\sqrt{35}$ $=13\sqrt{35}-72$

Binômes conjugués	carré d'une somme (ou différence) de deux termes
$(\sqrt{3}-\sqrt{5})(\sqrt{3}+\sqrt{5})$ $=(\sqrt{3})^2-(\sqrt{5})^2$ $=3-5=-2$	$(\sqrt{2}+\sqrt{5})^2=(\sqrt{2})^2+2\sqrt{2}.\sqrt{5}+(\sqrt{5})$ $=2+2\sqrt{10}+5$ $=7+2\sqrt{10}$
$(5+\sqrt{2})(5-\sqrt{2})=5^2-(\sqrt{2})^2$ $=25-2$ $=23$	$(\sqrt{7}-\sqrt{3})^2=(\sqrt{7})^2-2\sqrt{7}.\sqrt{3}+(\sqrt{3})^2$ $=7-2\sqrt{21}+3$ $=10-2\sqrt{21}$
$(4\sqrt{5}-\sqrt{2})(4\sqrt{5}+\sqrt{2})=(4\sqrt{5})^2-(\sqrt{2})^2$ $=16.5-2$ $=80-2=78$	$(\sqrt{3}+5)^2=(\sqrt{3})^2+2.\sqrt{3}.5+5^2$ $=3+10\sqrt{3}+25$ $=28+10\sqrt{3}$
$(5-\sqrt{8})(5+2\sqrt{2})=(5-2\sqrt{2})(5-2\sqrt{2})$ $=5^2-(2\sqrt{2})^2$ $=25-8=17$	$(\sqrt{3}-2\sqrt{5})^2=(\sqrt{3})^2-2.\sqrt{3}.2\sqrt{5}+(2\sqrt{5})^2$ $=3-4\sqrt{15}+4.5$ $=23-4\sqrt{15}$
$(-3\sqrt{2}+\sqrt{7})(\sqrt{7}+3\sqrt{2})=(\sqrt{7})^2-(3\sqrt{2})^2$ $=7-9.2$ $=7-18$ $=-11$	$(2\sqrt{7}+1)^2=(2\sqrt{7})^2+2.2\sqrt{7}.1+1^2$ $=4.7+4\sqrt{7}+1$ $=29+4\sqrt{7}$

Série supplémentaire AM P 41 n° 12

a) $\sqrt{5}.(\sqrt{6}+\sqrt{15})=\sqrt{5.6}+\sqrt{5.5.3}=\sqrt{30}+\sqrt{5^2.3}=\sqrt{30}+5\sqrt{3}$

$\sqrt{12}.(\sqrt{48}-\sqrt{5})=\sqrt{12.12.4}-\sqrt{12.5}=\sqrt{12^2.2^2}-\sqrt{3.2^2.5}=24-2\sqrt{15}$

$(\sqrt{125}-3\sqrt{6}).\sqrt{32}=\sqrt{5^3.2^5}-3\sqrt{3.2.2^5}=\sqrt{5^2.5.2^4.2}-3\sqrt{3.2^6}=5.2^2\sqrt{10}-3.2^3\sqrt{3}=20\sqrt{10}-24\sqrt{3}$

$(3\sqrt{7}-\sqrt{28}).\sqrt{3}=3\sqrt{7.3}-\sqrt{2^2.7.3}=3\sqrt{21}-2\sqrt{21}=\sqrt{21}$

$5\sqrt{3}.(2\sqrt{27}-3\sqrt{20})=10\sqrt{3.3^3}-15\sqrt{3.2^2.5}=10\sqrt{3^4}-15\sqrt{3.2^2.5}=10.3^2-15.2\sqrt{15}$
$=90-30\sqrt{15}$

b) $(\sqrt{2}-1).(\sqrt{2}+3)=(\sqrt{2})^2+3\sqrt{2}-\sqrt{2}-3=2+2\sqrt{2}-3=-1+2\sqrt{2}$

$(\sqrt{5}+2).(3-\sqrt{5})=3\sqrt{5}-(\sqrt{5})^2+6-2\sqrt{5}=\sqrt{5}+1$

$(1-\sqrt{3}).(5-3\sqrt{3})=5-3\sqrt{3}-5\sqrt{3}+3(\sqrt{3})^2=5-8\sqrt{3}+3.3=14-8\sqrt{3}$

$(3+\sqrt{2}).(2-\sqrt{3})=3.2-3\sqrt{3}+2\sqrt{2}-\sqrt{6}=6-3\sqrt{3}+2\sqrt{2}-\sqrt{6}$

$(\sqrt{3}-\sqrt{5}).(3+\sqrt{5})=3\sqrt{3}+\sqrt{15}-3\sqrt{5}-(\sqrt{5})^2=3\sqrt{3}+\sqrt{15}-3\sqrt{5}-5$

c) $(\sqrt{3}+\sqrt{2}).(\sqrt{7}-\sqrt{6})=\sqrt{21}-\sqrt{3.3.2}+\sqrt{14}-\sqrt{2.2.3}=\sqrt{21}-3\sqrt{2}+\sqrt{14}-2\sqrt{3}$

$(2\sqrt{3}-\sqrt{5}).(3\sqrt{15}-\sqrt{6})=6\sqrt{3.5.3}-2\sqrt{3.3.2}-3\sqrt{5.5.3}+\sqrt{30}=18\sqrt{5}-6\sqrt{2}-15\sqrt{3}+\sqrt{30}$

$(\sqrt{24}-3\sqrt{8}).(\sqrt{50}+\sqrt{5})=\sqrt{400.3}+\sqrt{4.30}-3\sqrt{\underbrace{2^2.2.5^2.2}_{20^2}}+3\sqrt{2^3.5}=20\sqrt{3}+2\sqrt{30}-60+6\sqrt{10}$

$(5-3\sqrt{14}).(\sqrt{7}-1)=5\sqrt{7}-5-3\sqrt{2.7.7}+3\sqrt{14}=5\sqrt{7}-5-21\sqrt{2}+3\sqrt{14}$

$(2\sqrt{10}+3).(\sqrt{90}-2)=2\sqrt{30^2}-4\sqrt{10}+3\sqrt{3^2.10}-6=2.30-4\sqrt{10}+3.3\sqrt{10}-6$
$=54+5\sqrt{10}$

Exercices littéraux

Série 8 : Racines carrées et simplification *sous la forme $a\sqrt{b}$* (AM p 43 n°17)

a)	$\sqrt{a^4} = a^2$	$\sqrt{x^6} = x^3$	$\sqrt{b^{12}} = b^6$	$\sqrt{x^7} = \sqrt{x^6 . x}$ $= x^3\sqrt{x}$	$\sqrt{y^{11}} = \sqrt{y^{10}.y}$ $= y^5\sqrt{y}$	$\sqrt{r^9} = \sqrt{r^8.r}$ $= r^4\sqrt{r}$
b)	$\sqrt{a^{15}} = \sqrt{a^{14}.a}$ $= a^7\sqrt{a}$	$\sqrt{x^{25}} = \sqrt{x^{24}.x}$ $= x^{12}\sqrt{x}$	$\sqrt{y5} = \sqrt{y^4.y}$ $= y^2\sqrt{y}$	$\sqrt{a^{16}} = a^8$	$\sqrt{4a^7} = \sqrt{2^2 a^6 a}$ $= 2a^3\sqrt{a}$	$\sqrt{3a^9} = \sqrt{3a^8.a}$ $= a^4\sqrt{3a}$
c)	$\sqrt{5a^6} = \sqrt{5a^6}$ $= a^3\sqrt{5}$	$\sqrt{9a^7} = \sqrt{3^2a^6.a}$ $= 3a^3\sqrt{a}$	$\sqrt{8a^6} = \sqrt{2^2.2a^6}$ $= 2a^3\sqrt{2}$	$\sqrt{16a^{12}} = \sqrt{4^2a^{12}}$ $= 4a^6$	$\sqrt{27a^7} = \sqrt{3^2 3 a^6 a}$ $= 3a^3\sqrt{3a}$	$\sqrt{18a^5} = \sqrt{3^2.2a^4.a}$ $= 3a^2\sqrt{2a}$
d)	$7\sqrt{4a^6}$ $= 7.2.a^3$ $= 14a^3$	$3\sqrt{12a^5}$ $= 3\sqrt{2^2.3a^4.a}$ $= 3.2.a^2\sqrt{3a}$ $= 6a^2\sqrt{3a}$	$2\sqrt{18x^3}$ $= 2\sqrt{2.3^2.x^2.x}$ $= 2.3.x\sqrt{2x}$ $= 6x\sqrt{2x}$	$3\sqrt{27x^8}$ $= 3\sqrt{3^3x^8}$ $= 3.3\sqrt{3}\,x^4$ $= 9x^4\sqrt{3}$	$2\sqrt{45x^9}$ $= 2\sqrt{3^2.5.x^8x}$ $= 2.3.x^4\sqrt{5x}$ $= 6x^4\sqrt{5x}$	$5a\sqrt{3a^6}$ $= 5a\sqrt{3}.a^3$ $= 5a^4\sqrt{3}$ $= 5\sqrt{3}\,a^4$
e)	$2x\sqrt{8x^7}$ $= 2x\sqrt{2^2.2.x^6x}$ $= 2x.2.x^3\sqrt{2x}$ $= 4x^4\sqrt{2x}$	$3x^2\sqrt{27x^5}$ $= 3x^2\sqrt{3^2.3x^4x}$ $= 3x^2.3.x^2\sqrt{3x}$ $= 9x^4\sqrt{3x}$	$3x^3\sqrt{63x^7}$ $= 3x^3\sqrt{9.7x^6.x}$ $= 3x^3.3.x^3\sqrt{x}\sqrt{7}$ $= 9x^6\sqrt{7x}$	$2x\sqrt{8x^{12}}$ $= 2x\sqrt{2^3x^{12}}$ $= 2x.2x^6\sqrt{2}$ $= 4x^7\sqrt{2}$	$5a\sqrt{75a^9}$ $= 5a\sqrt{5^2.3a^8.a}$ $= 5a.5.a^4\sqrt{3a}$ $= 25a^5\sqrt{3a}$	$2a\sqrt{32a^{11}}$ $= 2a\sqrt{2^4.2a^{10}.a}$ $= 2a.2^2.a^5\sqrt{2a}$ $= 8a^6\sqrt{2a}$

Série 9 : Racines carrées et Termes semblables *(AM p 43 n°18)*

$2\sqrt{x} + 7\sqrt{x} = 9\sqrt{x}$	$-2\sqrt{18a} + 5\sqrt{32a} = -2\sqrt{3^2.2a} + 5\sqrt{2^4.2a}$ $= -2.3\sqrt{2a} + 5.2^2\sqrt{2a}$ $= -6\sqrt{2a} + 20\sqrt{2a}$ $= 14\sqrt{2a}$
$3\sqrt{a} - 5\sqrt{a} = -2\sqrt{a}$	$-4\sqrt{75x} - 12\sqrt{12x} =$ $= -4\sqrt{5^2.3x} - 12\sqrt{2^2.3x}$ $= -4.5\sqrt{3x} - 12.2\sqrt{3x}$ $= -20\sqrt{3x} - 24\sqrt{3x} = -44\sqrt{3x}$
$2\sqrt{3a} - 5\sqrt{3a} = -3\sqrt{3a}$	$5\sqrt{3x} - 2\sqrt{48x} = 5\sqrt{3x} - 2\sqrt{4^2.3x}$ $= 5\sqrt{3x} - 2.4\sqrt{3x}$ $= 5\sqrt{3x} - 8\sqrt{3x} = -3\sqrt{3x}$
$9\sqrt{5x} - 7\sqrt{5x} = 2\sqrt{5x}$	$-3\sqrt{8x} + \sqrt{32x} = -3\sqrt{2^2.2x} + \sqrt{2^4.2.x}$ $= -3.2\sqrt{2x} + 2^2\sqrt{2x}$ $= -6\sqrt{2x} + 4\sqrt{2x} = -2\sqrt{2x}$
$\sqrt{a} - \sqrt{18a} = \sqrt{a} - \sqrt{3^2.2a}$ $= \sqrt{a} - 3\sqrt{2a}$	$-2x\sqrt{3x^3} + 5\sqrt{3x^5} = -2x\sqrt{3x^2.x} + 5\sqrt{3x^4.x}$ $= -2x.x\sqrt{3x} + 5.x^2\sqrt{3x}$ $= -2x^2\sqrt{3x} + 5x^2\sqrt{3x}$ $= 3x^2\sqrt{3x}$
$\sqrt{27x} - 3\sqrt{12x} = \sqrt{3^2.3x} - 3\sqrt{2^2.3x}$ $= 3\sqrt{3x} - 6\sqrt{3x}$ $= -3\sqrt{3x}$	$3x^3\sqrt{8x} - 2x\sqrt{18x^5} =$ $= 3x^3.2\sqrt{2x} - 2x.3x^2\sqrt{2x}$ $= 6x^3\sqrt{2x} - 6x^3\sqrt{2x} = 0$

Série 10 : Racines carrées et produit

a) b) *(AM p 43 n°19) + Boutriau P 85 n°4*

$\sqrt{x}\,.\sqrt{3x} = \sqrt{3x^2}$ $= x\sqrt{3}$	$3\sqrt{x^4}\,.\sqrt{x} = 3.\,x^2\sqrt{x}$ $= 3x^2\sqrt{x}$
$5\sqrt{y}\,.2\sqrt{y} = 10\sqrt{y^2}$ $= 10.\,y$	$5\sqrt{x^2}\,.\sqrt{x^5} = 5.\,x\sqrt{x^4.x}$ $= 5.\,x.\,x^2\sqrt{x}$ $= 5\,x^3\sqrt{x}$
$7\sqrt{x}\,.\sqrt{x^3} = 7.\sqrt{x^4}$ $= 7.\,x^2$	$4\sqrt{a^3}\,.3\sqrt{a^8} = 12\sqrt{a^3.a^8}$ $= 12\sqrt{a^{10}.a}$ $= 12\,a^5\sqrt{a}$
$3\sqrt{x^3}\,.\sqrt{x^5} = 3\sqrt{x^8}$ $= 3\,x^4$	$2\sqrt{x}\ \sqrt{x^5}\ \sqrt{x^7} = 2\sqrt{x^{12}.x}$ $= 2.\,x^6\sqrt{x}$
$2\sqrt{x^7}\,.\sqrt{x^3} = 2\sqrt{x^7.x^3}$ $= 2\sqrt{x^{10}}$ $= 2.\,x^5$	$3\sqrt{4a^5}\,.2\sqrt{a^3} = 3.2\sqrt{2^2\,a^8}$ $= 3.\,2.2a^4$ $= 2.6\ a^4 = 12a^4$

Série 11 : Racines carrées et Equations : détermine la valeur de a dans les cas suivants

$\sqrt{a} = 8$ $\Leftrightarrow (\sqrt{a})^2 = 8^2$ $\Leftrightarrow a = 64$ $\boxed{a = 64}$	$\sqrt{100} = \frac{a}{2}$ $\Leftrightarrow 10 = \frac{a}{2}$ $\Leftrightarrow a = 2.10$ $\Leftrightarrow a = 20$	$2.\sqrt{a} = 6$ $\Leftrightarrow \sqrt{a} = \frac{6}{2}$ $\Leftrightarrow \sqrt{a} = 3$ $\Leftrightarrow (\sqrt{a})^2 = 3^2$ $\Leftrightarrow a = 9$
$\sqrt{100} = 2a$ $\Leftrightarrow 10 = 2a$ $\Leftrightarrow 2a = 10$ $\Leftrightarrow a = \frac{10}{2}$ $\Leftrightarrow a = 5$	$\sqrt{25} = a + 1$ $\Leftrightarrow 5 = a + 1$ $\Leftrightarrow a + 1 = 5$ $\Leftrightarrow a = 5 - 1$ $\Leftrightarrow \boxed{a = 4}$	$4 + \sqrt{a} = 7$ $\Leftrightarrow \sqrt{a} = 7 - 4$ $\Leftrightarrow \sqrt{a} = 3$ $\Leftrightarrow (\sqrt{a})^2 = 3^2$ $\Leftrightarrow a = 9.$

Exercices de synthèse

Série 12 : AM p 41 n°13

$\sqrt{3}.\sqrt{3} = (\sqrt{3})^2 = 3$	$3\sqrt{2}+5\sqrt{2} = 8\sqrt{2}$	$3\sqrt{5}+1\sqrt{5} = 4\sqrt{5}$
$\sqrt{3}+\sqrt{3} = 2\sqrt{3}$	$2\sqrt{7}-5\sqrt{7} = -3\sqrt{7}$	$2\sqrt{3}.1\sqrt{3} = 2.3 = 6$
$\sqrt{5}+\sqrt{2} = - = \sqrt{5}+\sqrt{2}$	$3\sqrt{5}.4\sqrt{3} = 12\sqrt{15}$	$5\sqrt{2}+\sqrt{2} = 6\sqrt{2}$
$\sqrt{5}.\sqrt{2} = \sqrt{10}$	$2\sqrt{3}.5\sqrt{3} = 10(\sqrt{3})^2 = 30$	$7\sqrt{5}.\sqrt{5} = 7.5 = 35$
$2\sqrt{3}+5\sqrt{3} = 7\sqrt{3}$	$7\sqrt{5}+2\sqrt{3}$ idem $= 7\sqrt{5}+2\sqrt{3}$	$8\sqrt{3}+\sqrt{2}$ idem $= 8\sqrt{3}+\sqrt{2}$

$\sqrt{12}+\sqrt{75} = 2\sqrt{3}+5\sqrt{3} = 7\sqrt{3}$	$3\sqrt{2}.\sqrt{2} = 3.2 = 6$	$(\sqrt{7})^2 = 7$
$\sqrt{8}.\sqrt{45} = 2\sqrt{2}.3\sqrt{5} = 6\sqrt{10}$	$3\sqrt{2}+\sqrt{2} = 4\sqrt{2}$	$(2\sqrt{5})^2 = 4.5 = 20$
$\sqrt{24}.\sqrt{3} = 2\sqrt{6}.\sqrt{3} = 6\sqrt{2}$	$2\sqrt{3}.\sqrt{3} = 2.3 = 6$	$(-3\sqrt{2})^2 = 9.2 = 18$
$\sqrt{50}+\sqrt{20} = 5\sqrt{2}+2\sqrt{5}$	$2\sqrt{5}+\sqrt{2}$ idem $= 2\sqrt{5}+\sqrt{2}$	$(\sqrt{3}+\sqrt{2})^2 = 3+2\sqrt{6}+2 = 5+2\sqrt{6}$
$\sqrt{50}.\sqrt{20} = \sqrt{1000} = \sqrt{10^2}.\sqrt{10} = 10\sqrt{10}$	$\sqrt{2}.2\sqrt{5} = 2\sqrt{10}$	$(\sqrt{5}-\sqrt{2})^2 = 5-2\sqrt{10}+2 = 7-2\sqrt{10}$

$(-5\sqrt{5})^2 = 25.5 = 125$	$(2\sqrt{3}-\sqrt{5}).2 = 4\sqrt{3}-2\sqrt{5}$	$\sqrt{24}+\sqrt{150} = \sqrt{2^2.6}+\sqrt{5^2.6} = 4\sqrt{6}+5\sqrt{6} = 9\sqrt{6}$
$(\sqrt{6}-\sqrt{3})^2 = (\sqrt{6})^2-2\sqrt{18}+(\sqrt{3})^2 = 6-6\sqrt{2}+3 = 9-6\sqrt{2}$	$(2\sqrt{3}-\sqrt{5})^2 = 4.3-4\sqrt{15}+5 = 17-4\sqrt{15}$	$4\sqrt{3}.2\sqrt{3} = 8.3 = 24$
$(6\sqrt{2})^2 = 36.2 = 72$	$(-2\sqrt{3})^2 = 4.3 = 12$	$4\sqrt{3}+2\sqrt{3} = 6\sqrt{3}$
$(6-\sqrt{2})^2 = 36-12\sqrt{2}+2 = 38-12\sqrt{2}$	$2\sqrt{3}(\sqrt{5}-2) = 2\sqrt{15}-4\sqrt{3}$	$\sqrt{32}.\sqrt{24} = \sqrt{2^4.2.2^2.2.3} = \sqrt{2^8.3} = 2^4\sqrt{3} = 16\sqrt{3}$
$(-5+\sqrt{5})^2 = 5-10\sqrt{5}+5 = 10-10\sqrt{5}$	$(2-\sqrt{5})(2+\sqrt{5}) = 2^2-5 = -1$	$3\sqrt{6}.\sqrt{12} = 3\sqrt{6.6.2} = 3.6\sqrt{2} = 18\sqrt{2}$

$2\sqrt{3}(\sqrt{3}+\sqrt{3}) = 2.3+2\sqrt{3} = 6+2\sqrt{3}$	$(3\sqrt{6}+\sqrt{2})(\sqrt{2}-3\sqrt{6}) = \cancel{3\sqrt{4.3}}-9.6+2-\cancel{3\sqrt{12}} = -54+2 = -52$
$(\sqrt{2}-5)(\sqrt{2}+5) = (\sqrt{2})^2-5^2 = 2-25 = -23$	$(\sqrt{5}-2)(\sqrt{5}+2) = 5-2^2 = 1$
$(\sqrt{6}+\sqrt{10})^2 = 6+2\sqrt{5.2^2.3}+10 = 16+4\sqrt{15}$	$(\sqrt{12}+\sqrt{5})(5\sqrt{3}+\sqrt{20}) = 5\sqrt{36}+\sqrt{4.3.4.5}+5\sqrt{15}+\sqrt{5.5.4} = 30+4\sqrt{15}+5\sqrt{15}+10 = 40+9\sqrt{15}$
$7\sqrt{50}+4\sqrt{18} = 7\sqrt{5^2.2}+4\sqrt{3^2.2} = 35\sqrt{2}+12\sqrt{2} = 47\sqrt{2}$	$2\sqrt{3}.5\sqrt{2}+\sqrt{24} = 10\sqrt{6}+2\sqrt{6} = 12\sqrt{6}$
$(-2\sqrt{7})^2 = 4.7 = 28$	$(2\sqrt{3}+5\sqrt{2})\sqrt{24} = 2\sqrt{72}+5\sqrt{48} = 2\sqrt{36.2}+5\sqrt{16.3} = 12\sqrt{2}+20\sqrt{3}$