

CALCUL NUMÉRIQUE Racines Fiche 2	Secteur de Chalon sur Saône – Louhans Correction des exercices	Difficulté * Facile ** Moyen *** Difficile
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Exercice 1 *

$$a = \sqrt{2} \times \sqrt{8} = \sqrt{16} = 4 \quad b = \sqrt{10} \times \sqrt{100} = 10\sqrt{10} \quad c = \sqrt{3} \times \sqrt{12} = 6 \quad d = \sqrt{80} \times \sqrt{8} = 8\sqrt{10}$$

$$e = \sqrt{75} \times \sqrt{52} = 10\sqrt{39} \quad f = \sqrt{99} \times \sqrt{165} = 33\sqrt{15} \quad g = \sqrt{27} \times \sqrt{15} = 9\sqrt{5} \quad h = \sqrt{63} \times \sqrt{14} = 21\sqrt{2}$$

Exercice 2 **

$$a = \sqrt{330} \times \frac{\sqrt{66}}{6} = 11\sqrt{5} \quad b = 2\sqrt{3} \times \sqrt{21} \times \frac{1}{6} = \sqrt{7} \quad c = \sqrt{45} \times (-\sqrt{20}) = -30$$

$$d = (-\sqrt{63}) \times (-\sqrt{14}) = 21\sqrt{2}$$

Exercice 3 *

$$a = 3\sqrt{3} + 2\sqrt{3} + 5\sqrt{3} - 7\sqrt{3} = 3\sqrt{3} \quad b = -\sqrt{11} + 10\sqrt{11} - 7\sqrt{11} - 2\sqrt{11} = 0$$

$$c = \frac{3}{2}\sqrt{7} - \frac{2}{3}\sqrt{7} = \frac{5}{6}\sqrt{7} \quad d = (3 - 5\sqrt{3}) - (6\sqrt{3} - 7) = -11\sqrt{3} + 10$$

Exercice 4 **

$$a = \sqrt{18} + \sqrt{50} - \sqrt{8} + \sqrt{32} = 10\sqrt{2} \quad b = 2\sqrt{50} + 3\sqrt{162} - 5\sqrt{8} = 27\sqrt{2}$$

$$c = \sqrt{28} + \sqrt{63} - \sqrt{700} + \sqrt{112} = -\sqrt{7} \quad d = \sqrt{44} - 2\sqrt{99} + 5\sqrt{\frac{539}{25}} = 3\sqrt{11}$$

Exercice 5 ***

Écrire sous la forme $a + b\sqrt{c}$, où a , b et c sont des entiers avec c positif le plus petit possible.

$$a = 3\sqrt{2} + 2\sqrt{4} - 2\sqrt{2} = 4 + \sqrt{2} \quad b = (\sqrt{3} + 5)(\sqrt{3} - 5) = -22$$

$$c = (\sqrt{7} - 11)(\sqrt{7} + 11) = -114 \quad d = (\sqrt{2} + 5)^2 = 27 + 10\sqrt{2}$$

$$e = (2\sqrt{7} - 5)(2\sqrt{7} + 5) = 3 \quad f = (\sqrt{2} + \sqrt{3})(\sqrt{8} + 4\sqrt{2}) = 12 + 6\sqrt{6}$$

Exercice 6 ***

Développer et réduire :

$$a = (4 + 5\sqrt{2})^2 + (2\sqrt{2} - 3)(3\sqrt{2} + 5) = 63 + 41\sqrt{2}$$

$$b = (9 - 3\sqrt{7})^2 - (2\sqrt{11} - \sqrt{3})(8 - 11\sqrt{2}) = 144 - 54\sqrt{7} - 8\sqrt{11} + 22\sqrt{22} + 8\sqrt{3} - 11\sqrt{6}$$

Exercice 7 ***

Écrire sans radical au dénominateur :

$$a = \frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{3} \quad b = \frac{\sqrt{2}}{\sqrt{7}} = \frac{\sqrt{14}}{7} \quad c = \frac{1}{\sqrt{11}} - \frac{5}{\sqrt{8}} = \frac{\sqrt{11}}{11} - \frac{5\sqrt{2}}{4} \quad d = \frac{2}{\sqrt{2} + 5} = \frac{5(\sqrt{2} - 5)}{-23}$$

$$e = \frac{1}{\sqrt{3} - \sqrt{5}} = \frac{\sqrt{3} + \sqrt{5}}{-2} \quad f = \frac{\sqrt{7} + 1}{3 - \sqrt{2}} = \frac{(\sqrt{7} + 1)(3 + \sqrt{2})}{7}$$

$$g = \frac{\sqrt{5}}{\sqrt{3} + 2} - \frac{1}{\sqrt{5} + \sqrt{6}} = \frac{\sqrt{5}(\sqrt{3} - 2)}{-1} - \frac{\sqrt{5} - \sqrt{6}}{-1} = -\sqrt{15} + 3\sqrt{5} - \sqrt{6}$$