

Calculs sur les radicaux I

Simplifier les expressions suivantes autant que possible. Indication : pensez à la **factorisation première** des entiers !

1. $\sqrt{20}$ = $2\sqrt{5}$
2. $\sqrt{1000}$ = $10\sqrt{10}$
3. $\sqrt{96}$ = $4\sqrt{6}$
4. $\sqrt{4335}$ = $17\sqrt{15}$
5. $\sqrt{5472}$ = $12\sqrt{38}$
6. $\sqrt{6} \cdot \sqrt{2} \cdot \sqrt{21}$ = $6\sqrt{7}$
7. $\sqrt{3^4 \cdot 5^3}$ = $45\sqrt{5}$
8. $\sqrt{2^5 \cdot 7^3} \cdot \sqrt{14}$ = 392
9. $\sqrt{45} \cdot \sqrt{75} \cdot \sqrt{12} \cdot \sqrt{50}$ = $450\sqrt{10}$
10. $\sqrt{72} \cdot \sqrt{8} \cdot \sqrt{24} \cdot \sqrt{34}$ = $96\sqrt{51}$
11. $\sqrt{72} + \sqrt{8} + \sqrt{24} + \sqrt{54}$ = $5\sqrt{6} + 8\sqrt{2}$
12. $\frac{\sqrt{28}}{5} - \frac{\sqrt{12}}{3} - \frac{2\sqrt{175}}{3} + \frac{3\sqrt{243}}{2}$ = $\frac{77\sqrt{3}}{6} - \frac{44\sqrt{7}}{15}$
13. $2\sqrt{3} \cdot \frac{\sqrt{5}}{9} + \frac{\sqrt{2}}{3} - \sqrt{\frac{60}{121}} + \frac{7\sqrt{8} - \sqrt{3}}{5}$ = $\frac{4\sqrt{15}}{99} + \frac{47\sqrt{2}}{15} - \frac{\sqrt{3}}{5}$
14. $\frac{\sqrt{3} - 1}{4} - \frac{3 - 7\sqrt{27}}{5} + \frac{1 - 2\sqrt{75}}{6}$ = $\frac{167\sqrt{3}}{60} - \frac{41}{60}$
15. $(3\sqrt{5} - 7\sqrt{2})^2$ = $143 - 42\sqrt{10}$
16. $2(\sqrt{2} - 1)(\sqrt{6} + 7) - (5\sqrt{3} - 1)(3\sqrt{2} + 8)$ = $-36\sqrt{3} - 17\sqrt{6} + 17\sqrt{2} - 6$
17. $\left(\frac{\sqrt{2}}{4}\right)^2 + (1 + \sqrt{3})^2$ = $2\sqrt{3} + \frac{33}{8}$
18. $(\sqrt{5} - 1)(\sqrt{5} + 1)(\sqrt{3} + \sqrt{7})^2$ = $8\sqrt{21} + 40$
19. $\left(\sqrt{2} + \frac{\sqrt{3}}{5}\right)^2 - \left(\frac{2\sqrt{3}}{3} - \sqrt{2}\right)^2$ = $\frac{26\sqrt{6}}{15} - \frac{91}{75}$
20. $(\sqrt{2} + 1)^4$ = $12\sqrt{2} + 17$