## QUESTIONS BRÈVES - B

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|---|---|---|
| B1 | $\frac{\sqrt{3}}{7\sqrt{5}} = \frac{\sqrt{15}}{35}$ | |
| B2 | $\frac{8}{\sqrt{2}} = 4\sqrt{2}$ | |
| B3 | $\sqrt{11} - \sqrt{6} = \sqrt{5}$ | |
| B4 | $\sqrt{5} - \sqrt{2} = \frac{3}{\sqrt{5}+\sqrt{2}}$ | |
| B5 | $\sqrt{\frac{20}{63}} = \frac{2\sqrt{5}}{3\sqrt{7}}$ | |
| B6 | $\sqrt{43} - \sqrt{42} < \sqrt{116} - \sqrt{115}$ | |
| B7 | $\sqrt{10} + \sqrt{12} > 2\sqrt{11}$ | |
| B8 | $\sqrt{3 + 2\sqrt{2}} = 1 + \sqrt{2}$ | |
| B9 | $\sqrt{3 - 2\sqrt{2}} = 1 - \sqrt{2}$ | |
| B10 | $\sqrt{5 - 2\sqrt{6}} = \sqrt{3} - \sqrt{2}$ | |
| B11 | $\forall x \in \mathbb{R},\ \sqrt{x^2} = x$ | |
| B12 | $\forall x \in \mathbb{R},\ \sqrt{x^4} = x^2$ | |
| B13 | $\forall x \in [0, +\infty[\,,\ \sqrt{x^3} = \left(\sqrt{x}\right)^3$ | |
| B14 | $\exists n \in \mathbb{N};\ \sqrt{n^2 + 6n + 9} \notin \mathbb{N}$ | |
| B15 | $\forall (n,p) \in \mathbb{N}^2,\ \sqrt{n+p} > \sqrt{n} + \sqrt{p}$ | |
| B16 | $\forall n \in \mathbb{N}^\star,\ \frac{\sqrt{n}}{n+\sqrt{n}} < \frac{1}{\sqrt{n}+1}$ | |
| B17 | $\forall n \in \mathbb{N}^\star,\ \frac{n+1}{n\sqrt{n}} < \frac{\sqrt{n}+1}{n}$ | |
| B18 | $\forall n \in \mathbb{N}, \left(\sqrt{2}\right)^{2n} = 2^n$ et $\left(\sqrt{2}\right)^{2n+1} = 2^n\sqrt{2}$ | |
| B19 | La suite $\left(\sqrt{n}\right)_{n\in\mathbb{N}}$ comporte 3 termes en progression arithmétique | |

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| B20 | $\exists n \in \mathbb{N},\ \left(\sqrt{2}\right)^n > 1234,56$ | ★ |
| B21 | $\exists n \in \mathbb{N};\ n\sqrt{2} \in \mathbb{N}$ | ★ |
| B22 | $\forall (n,p) \in \mathbb{N}^{\star 2},\ \frac{1}{\sqrt{n}} + \frac{1}{\sqrt{p}} \leqslant \frac{2\max\{\sqrt{n}, \sqrt{p}\}}{\sqrt{np}}$ | |
| B23 | $\forall (n,p) \in \mathbb{N}^{\star 2},\ \frac{1}{\sqrt{n}} - \frac{1}{\sqrt{n+p}} = \frac{p}{\sqrt{n(n+p)}\left(\sqrt{n+p}+\sqrt{n}\right)}$ | |
| B24 | $\forall (n,p) \in \mathbb{N}^{\star 2},\ \frac{n+\sqrt{p}}{\sqrt{n+p}} < \sqrt{n} + \sqrt{\frac{p}{n}}$ | |
| B25 | $\forall n \in \mathbb{N}^\star,\ 1 + \frac{1}{\sqrt{2}} + \frac{1}{\sqrt{3}} + \cdots + \frac{1}{\sqrt{n}} \geqslant \sqrt{n}$ | ★ |
| B26 | $\forall n \in \mathbb{N}^\star,\ \sqrt{\frac{1}{2}} + \sqrt{\frac{2}{3}} + \sqrt{\frac{3}{4}} + \cdots + \sqrt{\frac{n}{n+1}} \leqslant n$ | |
| B27 | $\forall n \in \mathbb{N}^\star,\ \sum_{k=1}^{n} \frac{k^2}{\sqrt{k+1}} < \sum_{k=1}^{n} k\sqrt{k}$ | |
| B28 | $\forall n \in \mathbb{N}^\star,\ \sum_{k=1}^{n} \frac{k}{k+1} \geqslant \sum_{k=1}^{n} \sqrt{\frac{k}{k+1}}$ | |
| B29 | $\forall n \in \mathbb{N}^\star,\ \sum_{k=1}^{n} \frac{k}{k+1} \geqslant \frac{n}{2}$ | |
| B30 | $\forall n \in \mathbb{N}^\star,\ \sum_{k=1}^{n} \frac{k}{k+1} \geqslant \sum_{k=1}^{n} \frac{\sqrt{k}}{\sqrt{k+1}}$ | |
| B31 | $\lim\limits_{n\to\infty} \left(\sqrt{n+1} - \sqrt{n}\right) = 0$ | |
| B32 | $\lim\limits_{n\to\infty} \frac{\sqrt{n^2+n+2}}{2n+1} = 1$ | |
| B33 | $\lim\limits_{n\to-\infty} \frac{\sqrt{n^2+n+1}}{n+4} = 1$ | |
| B34 | $\lim\limits_{n\to\infty} \left(\sqrt{2}-1\right)^n = 0$ | |
| B35 | $\forall x \in [-1,+\infty[\,,\ \sqrt{1+x} \leqslant 1 + \frac{x}{2}$ | |
| B36 | $\forall x \in \mathbb{R},\ \sqrt{x^2+x+1} \geqslant 1$ | |
| B37 | $\forall x \in \,]-1,1[\,,\ \sqrt{\frac{1+x}{1-x}} \geqslant 1 + x$ | |
| B38 | $\forall (x,y) \in [0,+\infty[^2,\ \sqrt{xy} \leqslant \frac{x+y}{2}$ | ★ |
| B39 | $\forall (x,y) \in [0,+\infty[^2,\ \left(\sqrt{x}+\sqrt{y}\right)^2 \geqslant 2(x+y)$ | |
| B40 | $\forall (x,h) \in [0,+\infty[^2,\ \sqrt{x+h} - \sqrt{x} \leqslant \sqrt{h}$ | |
| B41 | $\lim\limits_{n\to\infty} \sin\left(\pi\left(\sqrt{2}+1\right)^n\right) = 0$ | ★ |