A4

Berechnen Sie folgende Grenzwerte

a) $\lim_{n\to\infty} (\sqrt{3+2n} - \sqrt{2n})$

b) $\lim_{n\to\infty} (\sqrt{n^2+4n} - \sqrt{n^2+n})$

a) $\sqrt{3+2n} - \sqrt{2n} = \frac{3+2n-2n}{\sqrt{3+2n}+\sqrt{2n}} = \frac{3}{\sqrt{3+2n}+\sqrt{2n}} \to 0$ für $n \to \infty$

3. Binom. Formel

b) $\sqrt{n^2+4n} - \sqrt{n^2+n} = \frac{n^2+4n-n^2-n}{\sqrt{n^2+4n}+\sqrt{n^2+n}} = \frac{3n}{\sqrt{n^2+4n}+\sqrt{n^2+n}}$

$= \frac{3}{\sqrt{1+\frac{4}{n}}+\sqrt{1+\frac{1}{n}}} \to \frac{3}{2}$ für $n \to \infty$

$\frac{4}{n} \to 0$, $\frac{1}{n} \to 0$