



Exercises Math Refresher
Übungen zu dem mathematischen Auffrischkurs
Winter term 2015/2016
Wintersemester 2015/2016

Sheet 2 / Blatt 2

Exercise 1. Compute (*Berechnen Sie:*):

- (a) $\lim_{n \rightarrow \infty} \frac{n^2+n}{2n^2+n}$
- (b) $\lim_{n \rightarrow \infty} \frac{(n+2)^2+n^4}{n^4+n^2+1000n}$
- (c) $\lim_{n \rightarrow \infty} \frac{8n^2+9n+1}{7n^3+8n^2}$
- (d) $\lim_{n \rightarrow \infty} \frac{(n+3)(n-1)^2}{4n^2+5}$
- (e) $\lim_{n \rightarrow \infty} \left(\frac{1}{n+2} + \frac{n}{n+1} \right)$
- (f) $\lim_{n \rightarrow \infty} \frac{\frac{1}{n}}{\frac{1}{n+1} + \frac{1}{n}}$

Exercise 2. Compute (*Berechnen Sie:*):

- (a) $\lim_{x \rightarrow \infty} \frac{x^2+x}{2x^2+x}$
- (b) $\lim_{x \rightarrow 1} \frac{x^2+x}{2x^2+x}$
- (c) $\lim_{x \rightarrow \infty} (5x^5 - 2x^3 + 7)e^{-x}$
- (d) $\lim_{x \rightarrow 0} (5x^5 - 2x^3 + 7)e^{-x}$
- (e) $\lim_{x \rightarrow \infty} x^{-2} \ln(x^2)$
- (f) $\lim_{x \rightarrow \infty} \sin\left(\frac{1}{x}\right)$