Oefening limieten 6

Antwoorden

1. $\lim_{n\to 0}\frac{\sin 2n}{n}=\lim_{n\to 0}\frac{2\sin n\cos n}{n}=\lim_{n\to 0}2\cos n.\frac{\sin n}{n}=2$

2. $\lim_{n\to\infty}\frac{2\cos n+1}{n}=0 \quad want \quad -1\le 2\cos n+1\le 3$

3. $\lim_{n\to\infty}\frac{2n+1}{4-n}=\lim_{n\to\infty}\frac{2+\frac{1}{n}}{\frac{4}{n}-1}=-2$

4. $\lim_{n\to 0}\frac{\sin 3n}{\sin 5n}=\lim_{n\to 0}\frac{\sin 3n}{3n}.\frac{5n}{\sin 5n}.\frac{3}{5}=\frac{3}{5}$

5. $\lim_{n\to\infty}\frac{n^2}{2^n}=0$

6. $\lim_{n\downarrow 0}\frac{n-\sqrt{n}}{n+\sqrt{n}}=\lim_{n\downarrow 0}\frac{\sqrt{n}-1}{\sqrt{n}+1}=-1$

7. $\lim_{n\to\infty}\frac{n^3-1}{2n^2+3n^3}=\frac{1}{3}$

8. $\lim_{n\to\infty}\frac{1-\cos n}{n^2}=\lim_{n\to\infty}\frac{1-(1-2\sin^2(\frac{1}{2}n))}{n^2}=\lim_{n\to\infty}\frac{2\sin^2(\frac{1}{2}n)}{n^2}=\lim_{n\to\infty}2.\frac{\sin^2(\frac{1}{2}n)}{(\frac{1}{2}n)^2}.\frac{1}{4}=\frac{1}{2}$

9. $\lim_{n\to 0}\frac{\sin^2 n}{2n^2}=\frac{1}{2}$

10. $\lim_{n\to\infty}\frac{3n+\sqrt{n}}{n-\sqrt{n}}=3$