

## Oefening limieten 3

## ANTWOORDEN

$$1. \lim_{n \rightarrow \infty} \frac{5n}{\sqrt{n^2 + 1}} = \lim_{n \rightarrow \infty} \frac{5}{\sqrt{1 + \frac{1}{n^2}}} = 5$$

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

$$3. \lim_{x \rightarrow \infty} (\sqrt{2x - 5} - \sqrt{2x + 3}) = \lim_{x \rightarrow \infty} \frac{-8}{\sqrt{2x - 5} + \sqrt{2x + 3}} = 0$$

$$4. \lim_{x \rightarrow \infty} \frac{\sin 2x}{x} = 0 \text{ met insluitstelling } \frac{-1}{x} \leq \frac{\sin 2x}{x} \leq \frac{1}{x}$$

$$5. \lim_{n \rightarrow \infty} \frac{(-1)^n}{\sqrt{n}} = 0 \text{ met insluitstelling } \frac{-1}{\sqrt{n}} \leq \frac{(-1)^n}{\sqrt{n}} \leq \frac{1}{\sqrt{n}}$$

$$6. \lim_{x \rightarrow \infty} \frac{\sqrt{x^2 - 4}}{2x} = \lim_{x \rightarrow \infty} \frac{\sqrt{1 - \frac{4}{x^2}}}{2} = \frac{1}{2}$$

$$7. \lim_{x \rightarrow \infty} \frac{\cos 2x}{x} = 0 \text{ met insluitstelling } \frac{-1}{x} \leq \frac{\cos 2x}{x} \leq \frac{1}{x}$$

$$8. \lim_{n \rightarrow 3} \frac{n^2 - 5n + 6}{2n - 6} = \lim_{n \rightarrow 3} \frac{(n-3)(n-2)}{2(n-3)} = \lim_{n \rightarrow 3} \frac{(n-2)}{2} = \frac{1}{2}$$

$$9. \lim_{n \rightarrow \infty} \frac{2n+1}{\sqrt{n^2 + n - 3}} = \lim_{n \rightarrow \infty} \frac{2 + \frac{1}{n}}{\sqrt{1 + \frac{1}{n} - \frac{3}{n^2}}} = 2$$

$$10. \lim_{x \rightarrow 0} \frac{e^x - 1}{x} = \lim_{\Delta x \rightarrow 0} \frac{e^{0+\Delta x} - e^0}{\Delta x} = \left( \frac{de^x}{dx} \right)_{x=0} = 1$$