

Oefening limieten 4 ANTWOORDEN

$$1. \lim_{x \rightarrow 5} \frac{x^2 - 25}{x - 5} = \lim_{x \rightarrow 5} \frac{(x-5)(x+5)}{x-5} = \lim_{x \rightarrow 5} (x+5) = 10$$

$$2. \lim_{x \downarrow 0} \frac{\sqrt{x}}{x} = \lim_{x \downarrow 0} \frac{1}{\sqrt{x}} = +\infty$$

$$3. \lim_{x \rightarrow \infty} \frac{\sin(x-1)}{2x} = 0 \quad \text{met insluitstelling} \quad \frac{-1}{2x} \leq \frac{\sin(x-1)}{2x} \leq \frac{1}{2x}$$

$$4. \lim_{x \rightarrow -\infty} \frac{e^x + e^{-x}}{e^{-x}} = \lim_{x \rightarrow -\infty} \frac{e^x + e^{-x}}{e^{-x}} \cdot \frac{e^x}{e^x} = \lim_{x \rightarrow -\infty} \frac{e^{2x} + 1}{1} = 1$$

5.

$$\lim_{x \rightarrow \infty} (\sqrt{x^2 - x} - \sqrt{x^2 + 2}) = \lim_{x \rightarrow \infty} \frac{-x + 2}{\sqrt{x^2 - x} + \sqrt{x^2 + 2}} = \lim_{x \rightarrow \infty} \frac{-1 + \frac{2}{x}}{\sqrt{1 - \frac{1}{x}} + \sqrt{1 + \frac{2}{x}}} = -\frac{1}{2}$$

$$6. \lim_{x \rightarrow \infty} e^{\frac{1}{1-x}} = 1 \quad \text{want} \quad \lim_{x \rightarrow \infty} \frac{1}{1-x} = 0$$

$$7. \lim_{x \rightarrow 0} \frac{\cos x}{x+1} = \frac{1}{1} = 1$$

$$8. \lim_{y \rightarrow 0} \frac{\sin 2y}{\sin y} = \lim_{y \rightarrow 0} \frac{2 \sin y \cos y}{\sin y} = \lim_{y \rightarrow 0} 2 \cos y = 2$$

$$9. \lim_{x \rightarrow 4} \frac{x^2 - 16}{x^2 + x - 20} = \lim_{x \rightarrow 4} \frac{(x-4)(x+4)}{(x+5)(x-4)} = \lim_{x \rightarrow 4} \frac{(x+4)}{(x+5)} = \frac{8}{9}$$

$$10. \lim_{x \rightarrow 0} \frac{\cos x - 1}{x} = \lim_{\Delta x \rightarrow 0} \frac{\cos(0 + \Delta x) - \cos 0}{\Delta x} = -\sin 0 = 0$$