

## Hulpmateriaal bij toets

standaardlimieten type  $\frac{0}{0}$

$$\lim_{x \rightarrow 0} \frac{\sin(x)}{x} = 1 \quad (1)$$

$$\lim_{x \rightarrow 0} \frac{\ln(x+1)}{x} = 1 \quad (2)$$

$$\lim_{x \rightarrow 0} \frac{e^x - 1}{x} = 1 \quad (3)$$

$$\lim_{x \rightarrow 0} \frac{1 - \cos(x)}{\frac{1}{2}x^2} = 1 \quad (4)$$

standaardlimieten type x naar "plus oneindig" of naar "min oneindig"

$$\lim_{x \rightarrow \pm\infty} \left(\frac{1}{x}\right) = 0 \quad (5)$$

$$\lim_{x \rightarrow \infty} (e^{-x}) = 0 \quad (6)$$

$$\lim_{x \rightarrow -\infty} (e^x) = 0 \quad (7)$$

$$\lim_{x \rightarrow \infty} \arctan(x) = \frac{\pi}{2} \quad (8)$$

$$\lim_{x \rightarrow -\infty} \arctan(x) = -\frac{\pi}{2} \quad (9)$$

## Afgeleiden van standaardfuncties

$f(x)$	$f'(x)$
$a^x$	$\ln(a) \cdot a^x$
$\ln  x $	$\frac{1}{x}$
${}^a \log  x $	$\frac{1}{x \ln a}$
$\sinh(x)$	$\cosh(x)$
$\cosh(x)$	$\sinh(x)$
$\tan(x)$	$\frac{1}{\cos^2(x)}$
$\cot(x)$	$-\frac{1}{\sin^2(x)}$
$\arcsin(x)$	$\frac{1}{\sqrt{1-x^2}}$
$\arccos(x)$	$\frac{-1}{\sqrt{1-x^2}}$
$\arctan(x)$	$\frac{1}{1+x^2}$

## kromming

$$k = \frac{y''}{\left(1 + (y')^2\right)^{\frac{3}{2}}} \quad (10)$$

De kromtestraal:

$$R = \left| \frac{1}{k} \right| = \left| \frac{\left(1 + (y')^2\right)^{\frac{3}{2}}}{y''} \right| \quad (11)$$