



# CAMI Wiskunde: Graad 12

## 12.5 Calculus

### 12.5 Differensiasie reëls

#### 1. Die afgeleide van 'n funksie

- (a) Bepaal  $f'(x)$  as  $f(x) = -7x - 4$ .
- (b) Bepaal  $\frac{df(x)}{dx}$  as  $f(x) = 5$ .
- (c) Bepaal  $D_x[f(x)]$  as  $f(x) = -9x - 3$ .
- (d) Bepaal  $f'(x)$  as  $f(x) = x$ .
- (e) Bepaal  $D_x[f(x)]$  as  $f(x) = -5x + 8$ .

#### 2. Die afgeleide van 'n funksie

- (a) Bepaal  $f'(x)$  as  $f(x) = -6x^3 - 4x^2 + 2x$ .
- (b) Bepaal  $D_x[f(x)]$  as  $f(x) = 5x^3 - x$ .
- (c) Bepaal  $\frac{df(x)}{dx}$  as  $f(x) = x^3 - 5x^2 + 6$ .
- (d) Bepaal  $f'(x)$  as  $f(x) = 3x^3 - x^2 + 8x + 4$ .
- (e) Bepaal  $D_x[f(x)]$  as  $f(x) = 3x^3 + 6x$ .

#### 3. Bepaal $f'(x)$ van die volgende funksies.

- (a)  $f(x) = \frac{9}{x}$
- (b)  $f(x) = \frac{4}{7x^7}$
- (c)  $f(x) = \frac{-6}{x^6}$



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(d)  $f(x) = \frac{x-1}{\sqrt{x}}$

(e)  $f(x) = \frac{12x^2 - 4x - 21}{6x + 7}$

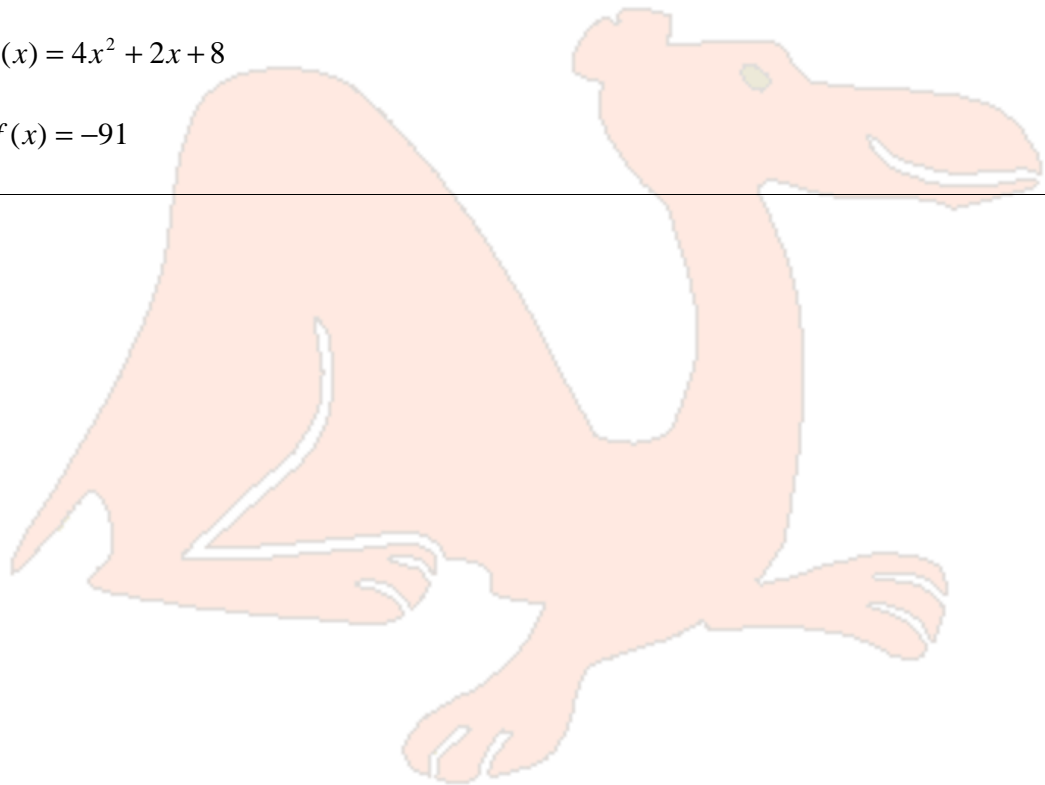
(f)  $f(x) = \frac{x^6 + x^4 + 1}{x}$

(g)  $f(x) = -x^3 - 5x^2 - 2x - 7$

(h)  $f(x) = x^{-6}$

(i)  $f(x) = 4x^2 + 2x + 8$

(j)  $f(x) = -91$





## MEMO

### 1. Die afgeleide van 'n funksie [5.6.4.3]

(a)  $f(x) = -7x - 4$   
 $f'(x) = -7$

(b)  $f(x) = 5$   
 $\frac{df(x)}{dx} = 0$

(c)  $f(x) = -9x - 3$   
 $D_x[f(x)] = D_x[-9x - 3] = -9$

(d)  $f(x) = x$   
 $f'(x) = 1$

(e)  $f(x) = -5x + 8$   
 $D_x[f(x)] = D_x[-5x + 8] = -5$

### 2. Die afgeleide van 'n funksie [5.6.4.4]

(a)  $f(x) = -6x^3 - 4x^2 + 2x$   
 $f'(x) = -18x^2 - 8x + 2$

(b)  $f(x) = 5x^3 - x$   
 $D_x[f(x)] = D_x[5x^3 - x] = 15x^2 - 1$

(c)  $f(x) = x^3 - 5x^2 + 6$   
 $\frac{df(x)}{dx} = 3x^2 - 10x$

(d)  $f(x) = 3x^3 - x^2 + 8x + 4$   
 $f'(x) = 9x^2 - 2x + 8$

(e)  $f(x) = 3x^3 + 6x$   
 $D_x[f(x)] = D_x[3x^3 + 6x] = 9x^2 + 6$



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3. Bepaal  $f'(x)$  van die volgende funksies. [5.6.4.5; 5.6.4.6; 5.6.4.7]

(a)  $f(x) = \frac{9}{x}$   
 $f(x) = \frac{9}{x} = 9x^{-1}$   
 $f'(x) = -9x^{-2}$   
 $f'(x) = \frac{-9}{x^2}$

(b)  $f(x) = \frac{4}{7x^7}$   
 $f(x) = \frac{4}{7x^7} = \frac{4}{7}x^{-7}$   
 $f'(x) = \frac{4}{7} \cdot (-7)x^{-8}$   
 $f'(x) = -4x^{-8}$   
 $f'(x) = \frac{-4}{x^8}$

(c)  $f(x) = \frac{-6}{x^6}$   
 $f(x) = \frac{-6}{x^6} = -6x^{-6}$   
 $f'(x) = -6 \cdot (-6)x^{-7}$   
 $f'(x) = 36x^{-7}$   
 $f'(x) = \frac{36}{x^7}$

(d)  $f(x) = \frac{x-1}{\sqrt{x}}$   
 $f(x) = \frac{x-1}{\sqrt{x}} = \frac{x}{\sqrt{x}} - \frac{1}{\sqrt{x}}$   
 $f(x) = x^{\frac{1}{2}} - x^{-\frac{1}{2}}$

$$f'(x) = \frac{1}{2}x^{-\frac{1}{2}} + \frac{1}{2}x^{-\frac{3}{2}}$$



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(e)  $f(x) = \frac{12x^2 - 4x - 21}{6x + 7}$

$$f(x) = \frac{12x^2 - 4x - 21}{6x + 7} = \frac{(6x + 7)(2x - 3)}{(6x + 7)} = 2x - 3$$

$$f'(x) = 2$$

(f)  $f(x) = \frac{x^6 + x^4 + 1}{x}$

$$f(x) = \frac{x^6 + x^4 + 1}{x} = x^5 + x^3 + x^{-1}$$

$$f'(x) = 5x^4 + 3x^2 - x^{-2}$$

(g)  $f(x) = -x^3 - 5x^2 - 2x - 7$

$$f'(x) = -3x^2 - 10x - 2$$

(h)  $f(x) = x^{-6}$

$$f'(x) = -6x^{-7}$$

(i)  $f(x) = 4x^2 + 2x + 8$

$$f'(x) = 8x + 2$$

(j)  $f(x) = -91$

$$f'(x) = 0$$