

Vraag 1 / Question 1

Bepaal $\frac{dy}{dx}$ as: / Find $\frac{dy}{dx}$ if:

(i) $y = e^{2x} \cos(3x)$

[1]

(ii) $y = x^2 \cdot 2^x$

[1]

(iii) $y = \sin^{-1}(\sqrt{x+1})$ (Notasie / Notation: $\sin^{-1}x = \arcsin x = \text{bgsin} x$)

[1]

(iv) $y = \sqrt{4+x^2}$

[1]

(v) $\cos(xy) = y$

[2]

Vraag 2 / Question 2

Vind $f(x)$ as: / Find $f(x)$ if:

(i) $f'(x) = 4\sin x + 2\cos x$

[1]

(i) $f'(x) = x^3\sqrt{x}$

[1]

Vraag 3 / Question 3

Gebruik die definisie van die afgeleide (eerste beginsels) om aan te toon dat

$$D_x(\cos x) = -\sin x.$$

Use the definition of the derivative (first principles) to show that $D_x(\cos x) = -\sin x$.

[4]

Vraag 4 / Question 4

Laat / Let $f(x) = x + 2\sin x$, $x \in [0, \pi]$.

Bepaal die vergelyking(s) van horisontale raaklyn(e) aan die grafiek van f .

Find the equation(s) of horizontal tangent line(s) to the graph of f .

[3]

Vraag 5 / Question 5

Vind die waarde(s) van r waarvoor $y = e^{rx}$ die vergelyking $\frac{d^2y}{dx^2} + 5\frac{dy}{dx} - 6y = 0$ bevredig.

Find the value(s) of r for which $y = e^{rx}$ satisfies the equation $\frac{d^2y}{dx^2} + 5\frac{dy}{dx} - 6y = 0$.

[3]

Vraag 6 / Question 6

Laat / Let $f(x) = \frac{\ln|x|}{x}$.

(i) Bepaal f se horisontale asimptote (indien enige). Toon alle berekeninge.

Find the horizontal asymptote(s) of f (if any). Show all computations.

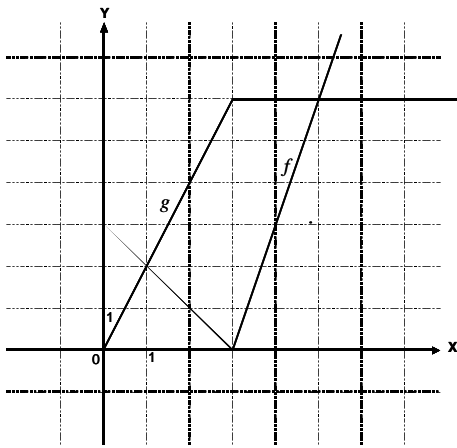
[2]

(ii) Bepaal f se vertikale asimptote (indien enige). Toon alle berekeninge.

Find the vertical asymptote(s) of f (if any). Show all computations.

[2]

Vraag 7 / Question 7



Laat / Let $P(x) = f(x)g(x)$, $Q(x) = \frac{f(x)}{g(x)}$ en / and $C(x) = f(g(x))$.

As f en g die funksies met grafieke soos in die skets, vind:

If f and g are the functions whose graphs are shown, find:

(i) $P'(2)$

[2]

(ii) $Q'(2)$

[2]

(iii) $C'(5)$

[2]

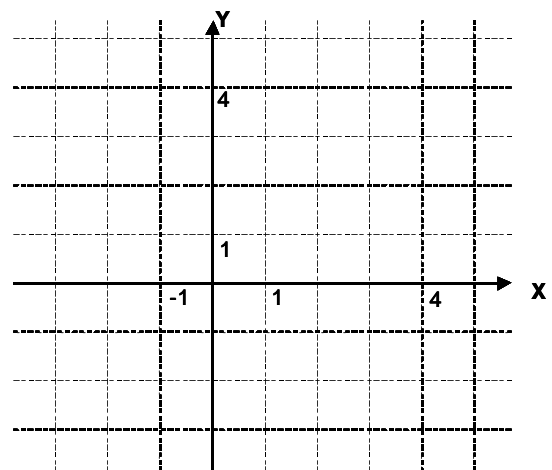
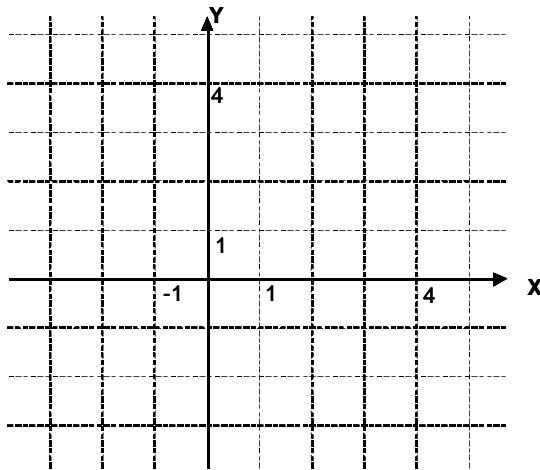
Vraag 8 / Question 8

Skets 'n funksie f met die volgende eienskappe :

Sketch a function f with the following properties.

- f is gedefinieer op \mathbb{R} / f is defined on \mathbb{R}
- $f'(-1) = 0$, $f'(1)$ bestaan nie / does not exist
- $f'(x) < 0$ as / if $|x| < 1$
- $f'(x) > 0$ as / if $|x| > 1$
- $f(-1) = 4$, $f(1) = 0$, $f''(x) < 0$ as / if $x \neq 1$

Rofwerk / Rough work

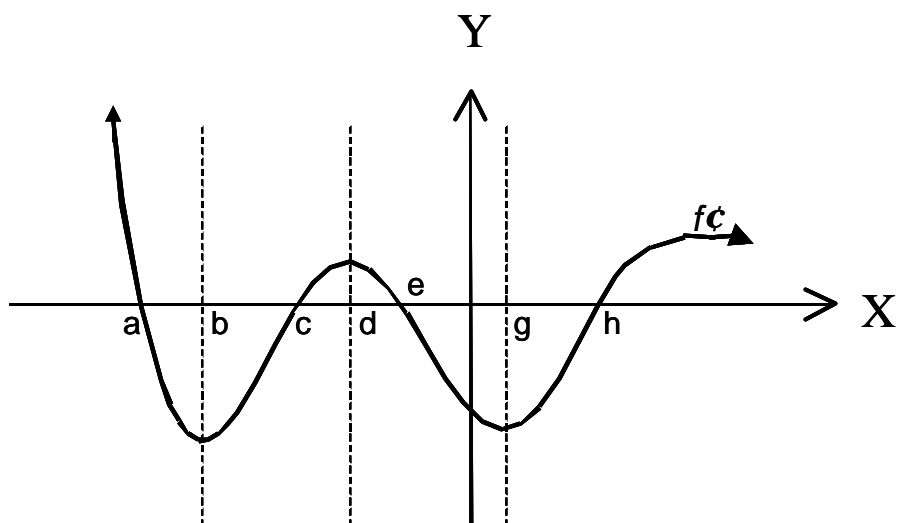


[3]

Vraag 9 / Question 9

Die grafiek van die AFGELEIDE funksie f' word gegee.

The graph of the DERIVATIVE function f' is given.



(i) Gee die kritieke getalle van f .

Give the critical numbers of f .

[1]

(ii) Gee die x -waarde(s) waar daar 'n lokale maksimum is.

Give the x -value(s) where there is a local maximum.

Omkring die korrekte x -waarde(s) / Circle the correct x -value(s)							
a	b	c	d	e	g	h	ander/ other

[1]

(iii) Gee die interval(le) waar f konkaf na onder is.

Give the interval(s) where f is concave downward.

[1]

(iv) Gee die x -waarde(s) waar daar 'n infleksiepunt (buigpunt) is.

Give the x -value(s) where there is an inflection point.

Omkring die korrekte x -waarde(s) / Circle the correct x -value(s)							
a	b	c	d	e	g	h	ander/ other

[1]