

VRAAG 1 / QUESTION 1

Laat / Let $f(x) = \cos 2x$.

1.1) Bereken $f'(x)$, $f''(x)$, $f^{(3)}(x)$ en $f^{(4)}(x)$.

Compute $f'(x)$, $f''(x)$, $f^{(3)}(x)$ and $f^{(4)}(x)$.

[2]

1.2) Bereken $f^{(13)}(0)$.

Compute $f^{(13)}(0)$.

[1]

VRAAG 2 / QUESTION 2

Laat / Let $f(x) = \frac{(2-x)^2}{4-x^2}$.

2.1) Bepaal die horizontale asymptote van f (indien enige). Toon alle berekeningen.

Determine the horizontal asymptotes of f (if any). Show all computations.

[3]

2.2) Bepaal die vertikale asymptote van f (indien enige). Toon alle berekeninge.

Determine the vertical asymptotes of f (if any). Show all computations.

[3]

2.3) Gee die interval(le) waarop f daal. Toon alle berekeninge.

Give the interval(s) where f is decreasing. Show all computations.

[3]

VRAAG 3 / QUESTION 3

As $f''(x) = -\frac{1}{x^2}$, $f(1) = 1$ en $f'(1) = 1$, bepaal $f(x)$.

If $f''(x) = -\frac{1}{x^2}$, $f(1) = 1$ and $f'(1) = 1$, find $f(x)$.

[3]

VRAAG 4 / QUESTION 4

Neem aan dat f en g differensieerbare funksies is, waarvan ons min weet.

Al wat ons van die funksies weet, is die onderstaande tabel met data:

Assume that f and g are differentiable functions that we know little about.

All we know of these functions are in the following table of data:

x	$f(x)$	$g(x)$	$f'(x)$	$g'(x)$
-1	-9	7	4	1
0	5	9	9	-3
1	3	-3	2	6

4.1) Laat $h(x) = g(x) \ln(x + 2)$. Bereken $h'(0)$.

Let $h(x) = g(x) \ln(x + 2)$. Compute $h'(0)$.

[3]

4.2) Laat $p(x) = [f(x) + x^2]^3$. Bereken $p'(1)$.

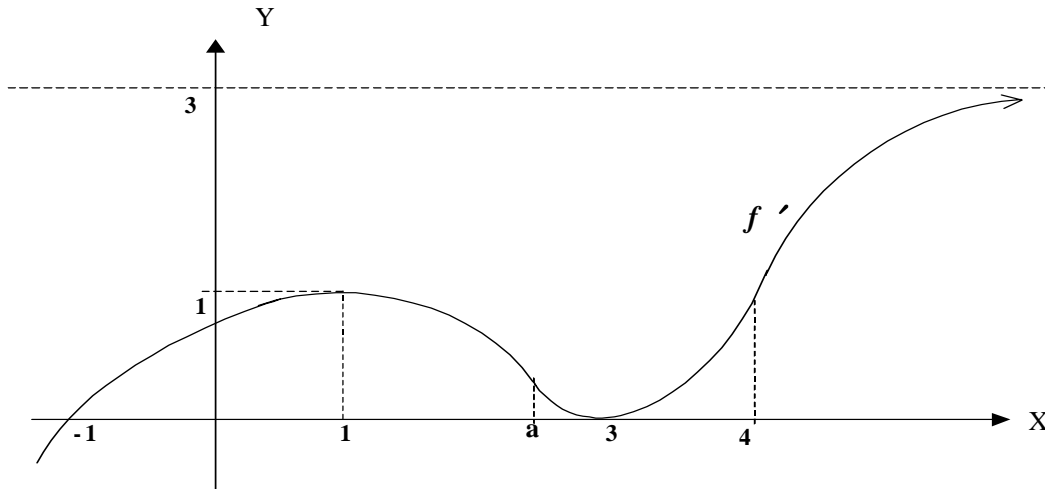
Let $p(x) = [f(x) + x^2]^3$. Compute $p'(1)$.

[3]

VRAAG 5 / QUESTION 5

Gegee die grafiek van die AFGELEIDE van 'n funksie f .

Given the graph of the DERIVATIVE of a function f .



5.1) Gee die interval(le) waar f daal. Gee redes vir jou antwoord.

Give the interval(s) where f is decreasing. Give reasons for your answer.

[2]

5.2) Gee die x -waardes waar f 'n lokale maksimum / minimum het. Gee redes vir jou antwoord.

Give the x -values where f has a local maximum / minimum. Give reasons for your answer.

[2]

5.3) Gee die interval(le) waar f konkaaf na onder is. Gee redes vir jou antwoord.

Give the interval(s) where f is concave downward. Give reasons for your answer.

[2]

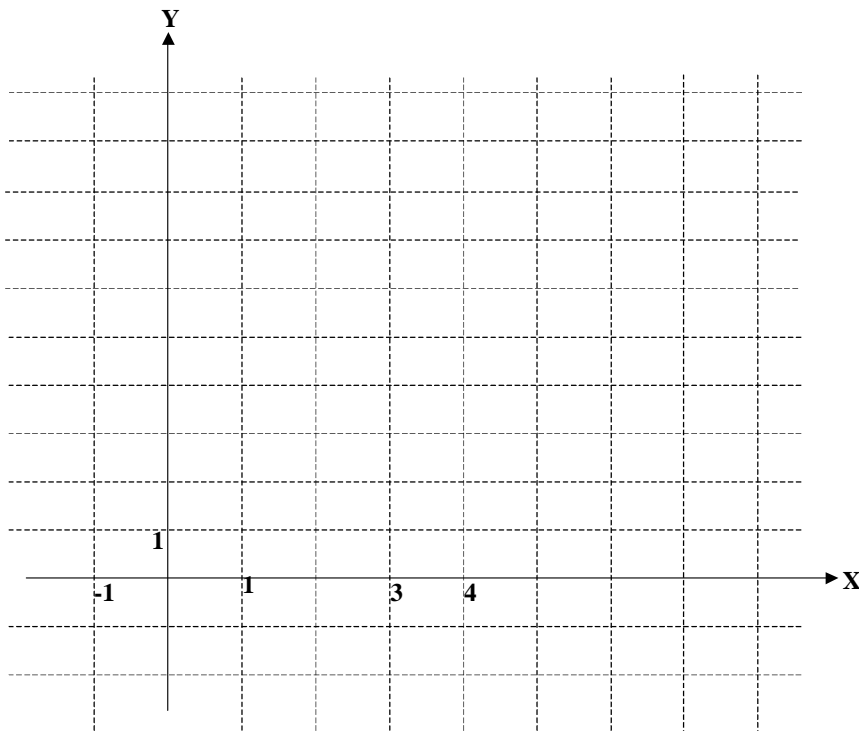
5.4) Gee die x -waardes waar f 'n infleksiepunt (buigpunt) het. Gee redes vir jou antwoord.

Give the x -values where f has an inflection point. Give reasons for your answer.

[2]

5.5) Skets $y = f(x)$ as $f(0) = 1$.

Sketch $y = f(x)$ if $f(0) = 1$.

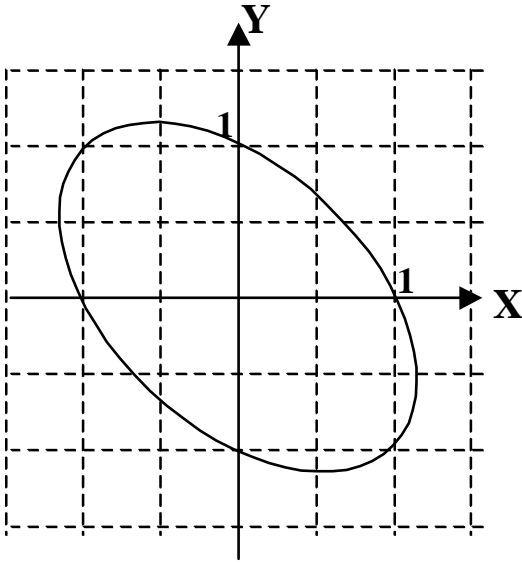


[4]

VRAAG 6 / QUESTION 6

Beskou die grafiek van $x^2 + xy + y^2 = 1$.

Consider the graph of $x^2 + xy + y^2 = 1$.



6.1) Bepaal 'n uitdrukking vir $\frac{dy}{dx}$ in terme van x en y .

Find an expression for $\frac{dy}{dx}$ in terms of x and y .

[4]

6.2) Bepaal die x-koördinate van alle punte waar die raaklyn ewewydig aan die lyn $y = -x$ is.

Determine the x-co-ordinates of all points where the tangent line is parallel to the line $y = -x$.

[4]

VRAAG 7 / QUESTION 7

As $h(x) = (1 + e^x)^{\tan x}$ bepaal $h'(x)$.

If $h(x) = (1 + e^x)^{\tan x}$ determine $h'(x)$.

[4]