KERNKONSEPTE / KEY CONCEPTS/DIKAKANYOKGOLO

FAKULTEIT / FACULTY/LEGORO: Natuurwetenskappe / Natural Sciences/Disaense tsa Tlhago

SKOOL / SCHOOL/sekolo: Rekenaarwetenskap, Statistiek en Wiskundige Wetenskappe / Computer Science, Statistics and Mathematical Sciences/Disanese tsa khomphiutha, Dipalopalo le tsa Mmetshe

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MODULEKODE EN -NAAM / MODULE CODE AND NAME/LEINA LE KHOUTE YA MODULE: WISK 121 Analise II / Analysis II/ Tshetsheko ll

Kernbegrip in Afrikaans	**Definisie/verklaring in Afrikaans**	**Key concept in English**	**Definition/explanation in English**	**Kakanyokgolo mo Setswaneng**	**Tlhaloso/Thanolo mo Setswaneng**
1. Afgeleide van *f* met betrekking tot *x*	Die funksie $f'(x)=\lim_{h\to 0}\left[f(x+h)-f(x)\right]/h$.	**1. Derivative of *f* with respect to *x***	The function $f'(x)=\lim_{h\to 0}\left[f(x+h)-f(x)\right]/h$.	**1.Diribethifi ya f mabapi le x**	Fanšene $f'(x)=\lim_{h\to 0}\left[f(x+h)-f(x)\right]/h$.
2. Vertikale	Die lyn $x = x_0$ as	**2. Vertical**	The line $x = x_0$ if	**2. Asimithoutu e**	Mola $x = x_0$ fa

asimptoot	$\lim_{x\to x_0^{\pm}} f(x) = \pm\infty$.	**asymptote**	$\lim_{x\to x_0^{\pm}} f(x) = \pm\infty$.	**e tsepameng**	$\lim_{x\to x_0^{\pm}} f(x) = \pm\infty$.
3. Horisontale asimptoot	Die lyn $y = y_0$ as $\lim_{x\to\pm\infty} f(x) = y_0$.	**3. Horizontal asymptote**	The line $y = y_0$ if $\lim_{x\to\pm\infty} f(x) = y_0$.	**3. Asimithoutu e e rapameng**	Mola $y = y_0$ fa $\lim_{x\to\pm\infty} f(x) = y_0$.
4. Globale minimumwaarde	*f(c)* in die punt *c* as $f(c) \le f(x)$ vir alle $x \in D_f$.	**4. Global minimum value**	*f(c)* in the point *c* if $f(c) \le f(x)$ for all $x \in D_f$.	**4. Selekanyo bonnyetlalo sa gotlhe**	*f(c)* mo ntlheng *c* fa $f(c) \le f(x)$ mo gotlhe $x \in D_f$.
5. Globale maksimumwaard e	*f(c)* in die punt *c* as $f(c) \ge f(x)$ vir alle $x \in D_f$.	**5. Global maximum value**	*f(c)* in the point *c* if $f(c) \ge f(x)$ for all $x \in D_f$.	**5. Selekanyo bogolotlalo sa gotlhe**	*f(c)* mo ntlheng *c* fa $f(c) \ge f(x)$ mo gotlhe $x \in D_f$.
6. Globale ekstreemwaarde	*f(c)* in die punt *c* as *f(c)* 'n globale minimum- of maksimumwaarde van *f* is.	**6. Global extreme value**	*f(c)* in the point *c* if *f(c)* is a global minimum or maximum value of *f*.	**6. Selekanyo se se feteletseng sa gotlhe**	*f(c)* mo ntlheng *c* fa *f(c)* e le selekanyo bonnyetlalo kgotsa bogolotlalo ba *f*.
7. Lokale minimumwaarde	*f(c)* in die punt *c* as $f(c) \le f(x)$ vir alle *x* in 'n oop interval wat *c* bevat.	**7. Local minimum value**	*f(c)* in the point *c* if $f(c) \le f(x)$ for all *x* in an open interval which contains *c*.	**7. Selekanyo bonnyetlalo sa golo**	*f(c)* mo ntlheng *c* fa $f(c) \le f(x)$ mo go tsotlhe *x* mo kgaotsong e e bulegileng e e nang le *c*.
8. Lokale maksimumwaard e	*f(c)* in die punt *c* as $f(c) \ge f(x)$ vir alle *x* in 'n oop interval wat *c* bevat.	**8. Local maximum value**	*f(c)* in the point *c* if $f(c) \ge f(x)$ for all *x* in an open interval which contains *c*.	**8. Selekanyo bogolotlalo sa golo**	*f(c)* mo ntlheng *c* fa $f(c) \ge f(x)$ mo go tsotlhe *x* mo kgaotsong e e bulegileng e e nang le *c*.
9. Lokale ekstreemwaarde	*f(c)* in die punt *c* as *f(c)* 'n lokale minimum- of maksimumwaarde van *f* is.	**9. Local extreme value**	*f(c)* in the point *c* if *f(c)* is a local minimum or maximum value of *f*.	**9. Selekanyo se se feteletseng sa golo**	*f(c)* mo ntlheng *c* fa *f(c)* e le selekanyo bonnyetlalo kgotsa selekanyo bogolotlalo sa *f*.
10. Kritieke punt	Enige $c \in D_f$ waarvoor	**10. Critical**	Any $c \in D_f$ for which $f'(c) = 0$	**10. Ntlha e e**	Nngwe le nngwe $c \in D_f$ e fa

	$f'(c) = 0$ of f nie differensieerbaar is nie.	**number**	or f is not differentiable.	**masisi**	$f'(c) = 0$ kgotsa f e sa farologantshegeng.
11. Stygende funksie op *A*	As vir elke keuse van $x_1, x_2 \in A$ met $x_1 < x_2$ geld dat $f(x_1) < f(x_2)$.	**11. Increasing function on *A***	If for every choice of $x_1, x_2 \in A$ with $x_1 < x_2$ it holds that $f(x_1) < f(x_2)$.	**11. Fanšene e e golang mo go A**	Fa nngwe le nngwe ya $x_1, x_2 \in A$ mme $x_1 < x_2$ go jaana $f(x_1) < f(x_2)$.
12. Dalende funksie op *A*	As vir elke keuse van $x_1, x_2 \in A$ met $x_1 < x_2$ geld dat $f(x_1) > f(x_2)$.	**12. Decreasing function on *A***	If for every choice of $x_1, x_2 \in A$ with $x_1 < x_2$ it holds that $f(x_1) > f(x_2)$.	**12. Fanšene e e ngotlegang mo go A**	Fa tlhopho nngwe le nngwe ya $x_1, x_2 \in A$ mme $x_1 < x_2$ go jaana $f(x_1) > f(x_2)$.
13. Konstante funksie op *A*	As vir elke keuse van $x_1, x_2 \in A$ geld dat $f(x_1) = f(x_2)$.	**13. Constant function on *A***	If for every choice of $x_1, x_2 \in A$ it holds that $f(x_1) = f(x_2)$.	**13. Fanšene e e sa fetogeng mo go A**	Fa tlhopho nngwe le nngwe ya $x_1, x_2 \in A$ go jaaka $f(x_1) = f(x_2)$.
14. Opwaarts konkaaf	As f' stygend is.	**14. Concave upwards**	If f' is increasing.	**14. Segopo godimo**	fa f' e oketsega.
15. Afwaarts konkaaf	As f' dalend is.	**15. Concave downwards**	If f' is decreasing.	**15. Segopo tlase**	fa f' e ngotlega.
16. Buigpunt	Die punt $(x_0, f(x_0))$ waar die konkawiteit van 'n kontinue funksie verander.	**16. Inflection point**	The point $(x_0, f(x_0))$ where the concavity of a continuous function changes.	**16. Ntlha kobego**	ntlha $(x_0, f(x_0))$ fa bosegopo ba fanšene e e tswelelang bo fetoga.
17. n-de graadse Taylor-polinoom van f om a	$T_n(x) = \sum_{k=0}^{n} \frac{f^{(k)}(a)}{k!}(x-a)^k$	**17. nth degree Taylor**	$T_n(x) = \sum_{k=0}^{n} \frac{f^{(k)}(a)}{k!}(x-a)^k$	**17. Pholinomiale ya Taylor ya dikerii**	$T_n(x) = \sum_{k=0}^{n} \frac{f^{(k)}(a)}{k!}(x-a)^k$

		polynomial of *f* about a		**nth gaufi le a**	
18. Oppervlak onder die kromme *f* oor die interval [*a*,*b*]	$A=\lim_{\Delta x_k\to 0}\sum_{k=1}^{n} f\left(x_k^*\right)\Delta x_k$ met *f* 'n positiewe kontinue funksie op [*a*,*b*], $a=x_0,x_1,\ldots,x_n=b$ 'n verdeling van die interval, $\Delta x_k=x_k-x_{k-1}$ en $x_k^*\in\left[x_{k-1},x_k\right]$.	**18. Area under the curve *f* over the interval [*a*,*b*]**	$A=\lim_{\Delta x_k\to 0}\sum_{k=1}^{n} f\left(x_k^*\right)\Delta x_k$ with *f* a positive continuous function on [*a*,*b*], $a=x_0,x_1,\ldots,x_n=b$ a partition of the interval, $\Delta x_k=x_k-x_{k-1}$ and $x_k^*\in\left[x_{k-1},x_k\right]$.	**18. Boalo ka fa tlase ga mothalo f mo kgaotsong [*a*,*b*]**	$A=\lim_{\Delta x_k\to 0}\sum_{k=1}^{n} f\left(x_k^*\right)\Delta x_k$ ka *f* e le fanšene e e nang le nnete e e tswelelang mo go [*a*,*b*], $a=x_0,x_1,\ldots,x_n=b$ e le karoganyo ya kgaotso, $\Delta x_k=x_k-x_{k-1}$ le $x_k^*\in\left[x_{k-1},x_k\right]$.
19. Integreerbaar oor die interval [*a*,*b*]	As die limiet $A=\lim_{\Delta x_k\to 0}\sum_{k=1}^{n} f\left(x_k^*\right)\Delta x_k$ bestaan en dieselfde is vir elke verdeling $a=x_0,x_1,\ldots,x_n=b$ van die interval [*a*,*b*] en elke keuse van die punte $x_k^*\in\left[x_{k-1},x_k\right]$.	**19. Integrable over the interval [*a*,*b*]**	If the limit $A=\lim_{\Delta x_k\to 0}\sum_{k=1}^{n} f\left(x_k^*\right)\Delta x_k$ exists and is the same for every partition $a=x_0,x_1,\ldots,x_n=b$ of the interval [*a*,*b*] and every choice of the points $x_k^*\in\left[x_{k-1},x_k\right]$.	**19. Inthekreite mo godimo ga kgaotso ya [*a*,*b*]**	fa limiti $A=\lim_{\Delta x_k\to 0}\sum_{k=1}^{n} f\left(x_k^*\right)\Delta x_k$ e e leng teng mme e tshwana mo nngwe le nngwe ya dikaroganyo $a=x_0,x_1,\ldots,x_n=b$ ya kgaotso [*a*,*b*] le nngwe le nngwe ya tlhopo ya dintlha $x_k^*\in\left[x_{k-1},x_k\right]$.
20. Bepaalde integraal van *f* oor die interval [*a*,*b*]	Die limiet getal $\int_a^b f(x)dx=\lim_{\Delta x_k\to 0}\sum_{k=1}^{n} f\left(x_k^*\right)\Delta x_k$ met $a=x_0,x_1,\ldots,x_n=b$ 'n verdeling van die interval [*a*,*b*], $\Delta x_k=x_k-x_{k-1}$ en	**20. Definite integral of *f* over the interval [*a*,*b*]**	The limit number $\int_a^b f(x)dx=\lim_{\Delta x_k\to 0}\sum_{k=1}^{n} f\left(x_k^*\right)\Delta x_k$ with $a=x_0,x_1,\ldots,x_n=b$ a partition of the interval [*a*,*b*], $\Delta x_k=x_k-x_{k-1}$ and	**20. Inthekerale e e ka lekanngwang mo kgaotsong ya [*a*,*b*]**	Nomoro ya tekanyo $\int_a^b f(x)dx=\lim_{\Delta x_k\to 0}\sum_{k=1}^{n} f\left(x_k^*\right)\Delta x_k$ fa $a=x_0,x_1,\ldots,x_n=b$ karoganyo ya kgaotso [*a*,*b*], $\Delta x_k=x_k-x_{k-1}$ le

	$x_k^* \in [x_{k-1}, x_k]$.		$x_k^* \in [x_{k-1}, x_k]$.		$x_k^* \in [x_{k-1}, x_k]$.