

KLASKAMER 10

GRAAD 12 WISKUNDE: EPISODE 19

RYE EN REEKSE 4 & FUNKSIES EN INVERSESES 1

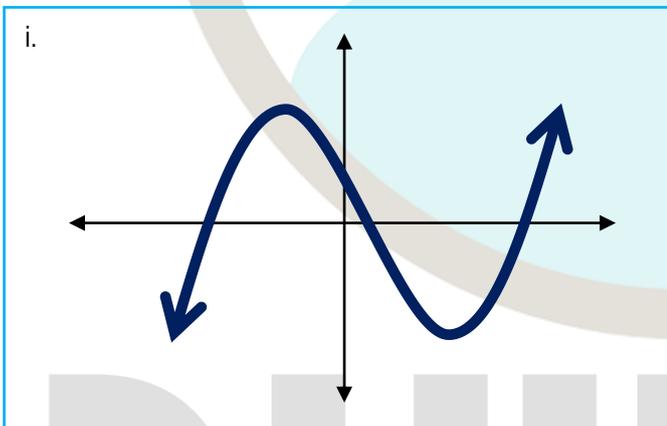
VRAAG 1

Bepaal die waarde van n indien: $\sum_{i=1}^n \left(\frac{1}{2}\right) \left(\frac{2}{3}\right)^{i-1} = \frac{2059}{1458}$

[5]

VRAAG 2

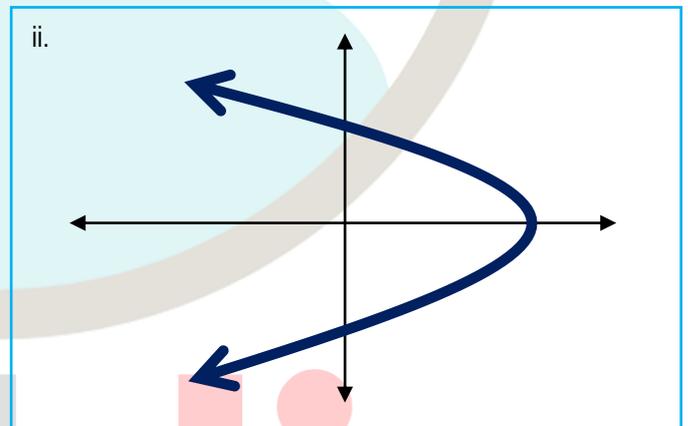
- a. In elk van die volgende, stel vas of the gegewe grafieke FUNKSIES is of net RELASIES. Klassifiseer ook elkeen as 'n spesifieke tipe RELASIE of FUNKSIE



RELASIE

FUNKSIE

(2)



RELASIE

FUNKSIE

(2)

- b. Gegee: $f(x) = -\sqrt{x}$; $g(x) = \frac{2}{x}$ en $h(x) = 3x - 1$. Bepaal elk van die volgende:

i. $f(g(8))$ (2)

ii. $h(g(f(4)))$ (3)

iii. $h([f(3)]^2)$ (3)

iv. $f(h(3) - 4)$ (3) [15]

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TOTAAL: 20 PUNTE

GRAAD 12 WISKUNDE: EPISODE 19 (MEMORANDUM)

RYE EN REEKSE 4 & FUNKSIES EN INVERSES 1

VRAAG 1

$$T_1 = \left(\frac{1}{2}\right) \left(\frac{2}{3}\right)^{1-1} = \frac{1}{2}$$

$$T_2 = \left(\frac{1}{2}\right) \left(\frac{2}{3}\right)^{2-1} = \frac{1}{3}$$

$$T_3 = \left(\frac{1}{2}\right) \left(\frac{2}{3}\right)^{3-1} = \frac{2}{9} \checkmark$$

$$\therefore a = \frac{1}{2}$$

$$r = \frac{T_2}{T_1} = \frac{\frac{1}{3}}{\frac{1}{2}} = \frac{2}{3} \checkmark$$

$$S_n = \frac{a(r^n - 1)}{r - 1} \checkmark$$

$$\frac{2059}{1458} = \frac{\frac{1}{2} \left(\left(\frac{2}{3}\right)^n - 1\right)}{\frac{2}{3} - 1} \checkmark$$

$$-\frac{2059}{2187} = \left(\frac{2}{3}\right)^n - 1$$

$$\frac{128}{2187} = \left(\frac{2}{3}\right)^n$$

$$\left(\frac{2}{3}\right)^7 = \left(\frac{2}{3}\right)^n$$

$$\therefore n = 7 \checkmark$$

OF

$$n = \log_2 \frac{128}{2187} (\checkmark)$$

$$n = 7 (\checkmark)$$

VRAAG 2:

- a. i) FUNKSIE \checkmark
Meer-eenduidige Funksie \checkmark
- ii) RELASIE \checkmark
Een-meerduidige Relasie \checkmark

b) i) $f(g(8))$

$$g(8) = \frac{2}{8} = \frac{1}{4} \checkmark$$

$$\therefore f(g(8)) = f\left(\frac{1}{4}\right)$$

$$\therefore f(g(8)) = -\sqrt{\frac{1}{4}}$$

$$\therefore f(g(8)) = -\frac{1}{2} \checkmark$$

ii) $h(g(f(4)))$

$$\therefore f(4) = -\sqrt{4} = -2 \checkmark$$

$$\therefore g(f(4)) = g(-2) = \frac{2}{-2} = -1 \checkmark$$

$$\therefore h(g(f(4))) = h(-1) = 3(-1) - 1 = -4 \checkmark$$

iii) $h([f(3)]^2)$

$$f(3) = -\sqrt{3} \checkmark$$

$$\therefore [f(3)]^2 = [-\sqrt{3}]^2 = 3 \checkmark$$

$$\therefore h([f(3)]^2)$$

$$= h(3) = 3(3) - 1 = 8 \checkmark$$

iv) $f(h(3) - 1)$

$$\therefore h(3) = 3(3) - 1 = 8 \checkmark$$

$$\therefore h(3) - 4 = 8 - 4 = 4 \checkmark$$

$$\therefore f(h(3) - 4)$$

$$= f(4) = -\sqrt{4} = -2 \checkmark$$