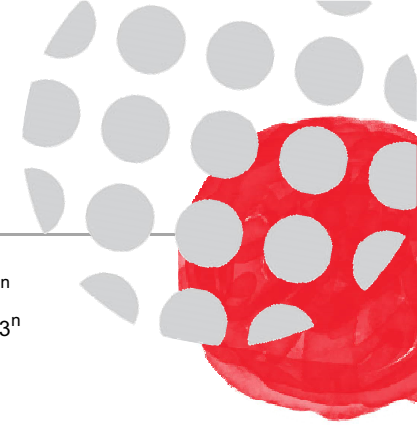




DBO NOV 2023 VRAESTEL 1 MEMO'S



ALGEBRA & VERGELYKINGS & ONGELYKHEDE [24]

1.1.1 $x^2 + x - 12 = 0$

$\therefore (x+4)(x-3) = 0$

$\therefore x+4 = 0$ of $x-3 = 0$

$\therefore x = -4 <$ of $x = 3 <$

1.1.2 $3x^2 - 2x = 6$

$\therefore 3x^2 - 2x - 6 = 0$

$\therefore x = \frac{-(-2) \pm \sqrt{(-2)^2 - 4(3)(-6)}}{2(3)}$...

$= \frac{2 \pm \sqrt{4+72}}{6}$

$\approx 1,79$ of $-1,12 <$

1.1.3 $\sqrt{2x+1} = x-1$

$\therefore (\sqrt{2x+1})^2 = (x-1)^2$

$\therefore 2x+1 = x^2 - 2x + 1$

$\therefore 0 = x^2 - 4x$

$\therefore x(x-4) = 0$

$\therefore x = 0$ of 4

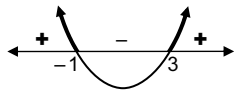
Slegs $x = 4 <$... *Vir $x = 0$
 $\sqrt{\quad}$ is neg*

1.1.4 $x^2 - 3 > 2x$

$\therefore x^2 - 2x - 3 > 0$

$\therefore (x-3)(x+1) > 0$

$\therefore x < -1$ of $x > 3 <$



$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$



1.2 $x+2 = 2y$

$\therefore x = 2y-2$... ①

$\frac{1}{x} + \frac{1}{y} = 1$

($\times xy$) $\therefore y+x = xy$... ②

① in ②: $\therefore y + (2y-2) = y(2y-2)$

$\therefore 3y-2 = 2y^2-2y$

$\therefore 0 = 2y^2-5y+2$

$\therefore (2y-1)(y-2) = 0$

$\therefore y = \frac{1}{2}$ of $y = 2$

Vir $y = \frac{1}{2}$: $x = 2\left(\frac{1}{2}\right) - 2 = -1$

& Vir $y = 2$: $x = 2(2) - 2 = 2$

\therefore Oplossing: $\left(-1; \frac{1}{2}\right)$ of $(2; 2) <$

OF:

$x+2 = 2y$

$\therefore x = 2y-2$... ①

$\frac{1}{x} + \frac{1}{y} = 1$... ②

① in ②: $\therefore \frac{1}{2y-2} + \frac{1}{y} = 1$ $\times y(2y-2)$

$\therefore y + 2y - 2 = y(2y-2)$

$\therefore y + 2y - 2 = 2y^2 - 2y$

$\therefore 2y^2 - 5y + 2 = 0$

$\therefore (2y-1)(y-2) = 0$

$\therefore y = \frac{1}{2}$ of $y = 2$

$\therefore x = -1$ of $x = 2$

$\therefore \left(-1; \frac{1}{2}\right)$ of $(2; 2) <$

1.3 $2^{m+1} + 2^m = 3^{n+2} - 3^n$

$\therefore 2^m \cdot 2 + 2^m = 3^n \cdot 3^2 - 3^n$

$\therefore 2^m(2+1) = 3^n(3^2-1)$

$\therefore 3 \cdot 2^m = 8 \cdot 3^n$

($\div 3 \cdot 8$) $\frac{2^m}{8} = \frac{3^n}{3}$

$\therefore \frac{2^m}{2^3} = \frac{3^n}{3}$

$\therefore 2^{m-3} = 3^{n-1}$

slegs moontlik indien $m-3 = 0$ en $n-1 = 0$

$\therefore m = 3$ of $n = 1$

$\therefore m+n = 4 <$

OF: $2^m(2+1) = 3^n(3^2-1)$

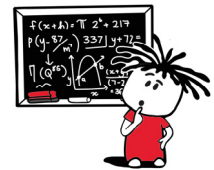
$\therefore 2^m \cdot 3 = 3^n \cdot 8$

$\frac{2^m}{3^n} = \frac{8}{3}$

$\therefore \frac{2^m}{3^n} = \frac{2^3}{3}$

$\therefore m = 3$ en $n = 1$

$\therefore m+n = 4 <$



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PATRONE & RYE [26]

2.1 **R.R.:** $7 + 12 + 17 + \dots$

2.1.1 **a** = 7 ; **d** = 5 ; **T₉₁**? ; **n** = 91

$$T_n = a + (n - 1)d$$

$$\begin{aligned} \therefore T_{91} &= 7 + (91 - 1)(5) \\ &= 457 < \end{aligned}$$

$$\begin{aligned} \text{OF: Algemene term, } T_n &= an + b \\ \text{waar } a &= 5 \text{ en } b = 2 \\ \therefore T_{91} &= 5(91) + 2 \\ &= 457 < \end{aligned}$$

2.1.2 **S_n** = $\frac{n}{2}(a + T_n)$

$$\begin{aligned} \therefore S_{91} &= \frac{91}{2}(7 + T_{91}) \\ &= \frac{91}{2}(7 + 457) \\ &= 21\,112 < \end{aligned}$$



$$\begin{aligned} \text{OF: } S_n &= \frac{n}{2}[2a + (n - 1)d] \\ \therefore S_{91} &= \frac{91}{2}[2(7) + (91 - 1)(5)] \\ &= 21\,112 < \end{aligned}$$

2.1.3 **n?** ; **T_n** = 517

$$\begin{aligned} T_n = a + (n - 1)d &\Rightarrow 517 = 7 + (n - 1)(5) \\ \therefore 517 &= 7 + 5n - 5 \\ \therefore 515 &= 5n \\ \therefore n &= 103 < \end{aligned}$$

$$\begin{aligned} \text{OF: } T_n &= an + b \\ \therefore 517 &= 5n + 2 \\ \therefore 515 &= 5n \\ \therefore n &= 103 < \end{aligned}$$

2.2.1 Algemene term: $T_n = an^2 + bn + c$

$$T_1 = 3 ; T_2 - T_1 = 9 \text{ en } T_3 - T_2 = 21$$

∴ Die patroon: $\begin{matrix} & & 3 & & 12 & & 33 & & 66 & & 111 \\ & & \swarrow & & \downarrow & & \swarrow & & \downarrow & & \swarrow \\ & 9 & & 21 & & 33 & & 45 & & & \\ & & \swarrow & & \downarrow & & \swarrow & & \downarrow & & \\ & & 12 & & 12 & & 12 & & & & \end{matrix}$

$$T_5 = 66 + 45 = 111 <$$

2.2.2 $T_1 = a + b + c = 3$

$$2a = 12 \quad \dots \text{ Algemene } 2^{\text{de}} \text{ verskil}$$

$$\therefore a = 6$$

$$\& 3a + b = 9 \quad \dots \text{ Die eerste } 1^{\text{ste}} \text{ verskil}$$

$$\therefore 18 + b = 9$$

$$\therefore b = -9$$

$$\therefore 6 + (-9) + c = 3$$

$$\therefore c = 6$$

$$\therefore T_n = 6n^2 - 9n + 6 <$$

2.2.3 $\frac{dT_n}{dn} = 12n - 9$

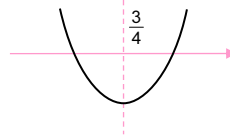
$$\text{As } n > \frac{3}{4} \quad 12n - 9 > 0$$

Aangesien $n \in \mathbb{N}$ sal die afgeleide altyd positief wees

∴ **T_n is altyd stygend vir alle $n \in \mathbb{N}$ <**

$$\text{OF: } T_n = 6n^2 - 9n + 6$$

$$\begin{aligned} \text{A van S: } n &= -\frac{-9}{2(6)} \\ &= \frac{3}{4} \end{aligned}$$



∴ **T_n is altyd stygend vir alle $n \in \mathbb{N}$ <**

OF:

$$\begin{aligned} T_{n+1} - T_n &= 6(n+1)^2 - 9(n+1) + 6 - (6n^2 - 9n + 6) \\ &= 6(n^2 + 2n + 1) - 9n - 9 + 6 - 6n^2 + 9n - 6 \\ &= 6n^2 + 12n + 6 - 9n - 9 - 6n^2 + 9n - 6 \\ &= 12n - 3 \end{aligned}$$

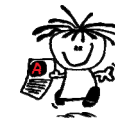
Aangesien $n \geq 1$ en 'n heelgetal is

∴ aangesien $n =$ die aantal terme

het $12n - 3$ 'n minimum waarde van $12(1) - 3 = 9$, wat positief is

∴ **Die verskil tussen opeenvolgende terme T_n en T_{n+1} sal altyd positief wees.**

∴ Die patroon is stygend vir alle $n \in \mathbb{N}$ <



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3.1 **M.R.:** $3 + 6 + 12 + \dots$ tot n terme

3.1.1 **a** = 3 ; **r** = 2

$$T_n = ar^{n-1} \rightarrow T_n = 3 \cdot 2^{n-1} \leftarrow$$

3.1.2 $\sum_{p=1}^k \frac{3}{2}(2)^p = 98\ 301 \dots$ d.w.s. **S_k** = 98 301

$$\begin{aligned} LK &= \frac{3}{2}(2)^1 + \frac{3}{2}(2)^2 + \frac{3}{2}(2)^3 + \dots + \frac{3}{2}(2)^k \\ &= 3 + 6 + 12 + \dots + \frac{3}{2}(2)^k \end{aligned}$$

Som, **S_n**, van 'n M.R. met **a** = 3 ; **r** = 2 ; **n** = k

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

$$\begin{aligned} S_k &= \frac{3(2^k - 1)}{2 - 1} \\ &= 3(2^k - 1) \end{aligned}$$

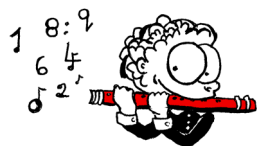
$$\therefore 3(2^k - 1) = 98\ 301$$

$$\therefore 2^k - 1 = 32\ 767$$

$$\therefore 2^k = 32\ 768$$

$$\therefore k = \log_2 32\ 768 \dots \text{OF, deur inspeksie}$$

$$\therefore k = 15 \leftarrow$$



3.2 **Rekenkundige Ry**

$$\begin{aligned} 1^{\text{ste}} \text{ term: } T_1 &= x \\ d &= 3 \end{aligned}$$

$$S_n = \frac{n}{2}[2a + (n - 1)d]$$

$$S_{22} = \frac{22}{2}[2x + (22 - 1)(3)]$$

$$= 11(2x + 63)$$

$$= 22x + 693$$

S₂₂ van die R.R. = **S_∞** van die M.R. + 734

$$\therefore 22x + 693 = \frac{3x}{2} + 734$$

$$(\times 2) \therefore 44x + 1\ 386 = 3x + 1\ 468$$

$$\therefore 41x = 82$$

$$\therefore x = 2$$

$$\text{d.w.s. } T_1 = 2 \leftarrow$$

Meetkundige Ry

$$T_1 = x$$

$$r = \frac{1}{3}$$

$$S_{\infty} = \frac{a}{1 - r}$$

$$= \frac{x}{1 - \frac{1}{3}}$$

$$= \frac{3x}{3 - 1}$$

$$= \frac{3x}{2}$$

NOTAS



FUNKSIES & GRAFIEKE [32]

4.1 $y = -4 \leftarrow$

4.2 By B, $y = 0$

$\therefore 2^x - 4 = 0$

$\therefore 2^x = 4$

$\therefore x = 2$

$\therefore \mathbf{B(2; 0) \leftarrow}$

4.3 y-afsnit van f:

$f(0) = 2^0 - 4 = 1 - 4 = -3$

$\therefore A(0; -3)$

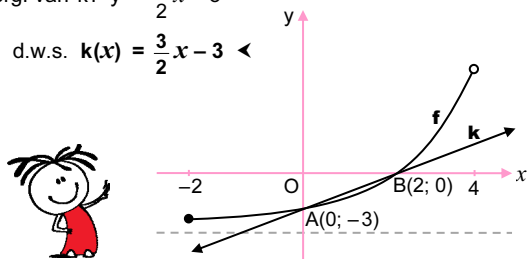
\therefore y-afsnit van k, $c = -3$

Gradiënt, $m = \frac{3}{2}$... *deur inspeksie*

(of: $m_{AB} = \frac{0 - (-3)}{2 - 0} = \frac{3}{2}$)

\therefore Verg. van k: $y = \frac{3}{2}x - 3$

d.w.s. $\mathbf{k(x) = \frac{3}{2}x - 3 \leftarrow}$



4.4 Die vertikale afstand = $k(x) - f(x)$

= $k(1) - f(1)$

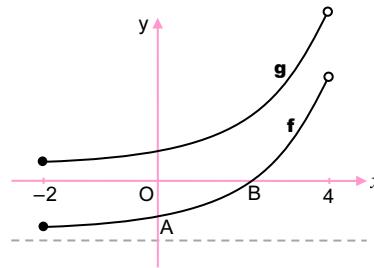
= $-\frac{3}{2} - (-2)$... $k(1) = \frac{3}{2}(1) - 3$ &

$f(1) = 2^1 - 4$

= $\frac{1}{2}$ eenheid \leftarrow

4.5 $g(x) = 2^x - 4 + 4$

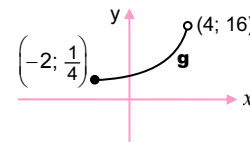
$\therefore \mathbf{g(x) = 2^x \leftarrow}$ vir $x \in [-2; 4)$



4.6 Die definisieversameling van g^{-1} = die waardeversameling van g

waardeversameling van g:

$\frac{1}{4} \leq y < 16$



\therefore definisieversameling van g^{-1} : $\frac{1}{4} \leq x < 16 \leftarrow$

4.7 $\mathbf{y = \log_2 x}$ vir $x \in \left[\frac{1}{4}; 16\right) \leftarrow$



NOTAS



5.1 Draaipunt van f: **B(1; 8)** <

5.2 By C, $x = 0$

$$\& f(0) = -\frac{1}{2}(0-1)^2 + 8 = 7\frac{1}{2}$$

$$\therefore \mathbf{C\left(0; 7\frac{1}{2}\right) <}$$

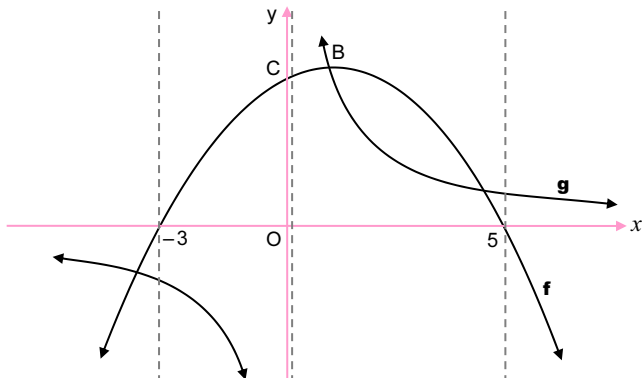
5.3 B(1; 8) 'n punt op g

$$\blacktriangleright g(1) = \frac{d}{1} = 8 \quad \dots \quad g(x) = \frac{d}{x}$$

$$\therefore \mathbf{d = 8 <}$$

5.4 $y \in \mathbb{R}; y \neq 0 <$

5.5 $-3 \leq x < 0$ of $x \geq 5 <$



$f(x):$	$f(x) < 0$	$f(x) > 0$	$f(x) > 0$	$f(x) < 0$
$g(x):$	$g(x) < 0$	$g(x) < 0$	$g(x) > 0$	$g(x) > 0$
$f(x) \cdot g(x):$	+ve	-ve	+ve	-ve

5.6 By enige snypunt(e):

$$h(x) = g(x)$$

$$\therefore -2x + k = \frac{8}{x}$$

$$(x \cdot x) \therefore -2x^2 + kx = 8$$

$$\times(-1) \therefore 2x^2 - kx + 8 = 0$$

$$\Delta = (-k)^2 - 4(2)(8) \quad \Delta = b^2 - 4ac$$

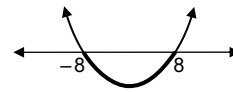
$$= k^2 - 64$$

Daar sal geen snypunkte wees as $\Delta < 0$

$$k^2 - 64 < 0$$

$$\therefore (k+8)(k-8) < 0$$

$$\therefore \mathbf{-8 < k < 8 <}$$



5.7 $g'(x) = -\frac{8}{x^2}$

$$\therefore -\frac{8}{x^2} = -2$$

$$\therefore x^2 = 4$$

$$\therefore x = \pm 2$$

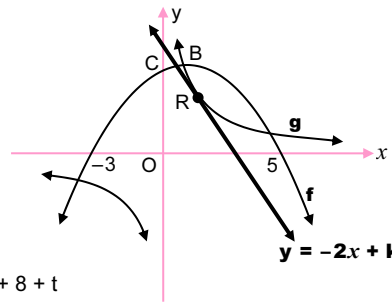
$$\therefore \mathbf{R(2; 4)}$$

$$y = -\frac{1}{2}(x-1)^2 + 8 + t$$

$$\therefore 4 = -\frac{1}{2}(2-1)^2 + 8 + t$$

$$\therefore 4 = -\frac{1}{2} + 8 + t$$

$$\therefore \mathbf{t = -3\frac{1}{2} <}$$



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FINANSIES, GROEI & VERVAL [16]

6.1 $P = R18\,500$; $i = \frac{r}{12}\%$; $n = 6$; $A = 19\,319,48$

6.1.1 $A = P(1+r)^n \Rightarrow 19\,319,48 = 18\,500\left(1 + \frac{i}{12}\right)^6$

$$\therefore \left(1 + \frac{i}{12}\right)^6 = \frac{19\,319,48}{18\,500}$$

$$= 1,04429\dots$$

$$\therefore 1 + \frac{i}{12} = \sqrt[6]{1,04429\dots}$$

$$= 1,00725\dots$$

$$\therefore \frac{i}{12} = 0,00725$$

$$\therefore i \approx 0,087$$

$$\therefore r \approx 8,70\% <$$



6.1.2 $1 + i_{\text{eff}} = \left(1 + \frac{i_{\text{nom}}}{m}\right)^m$

$$\therefore 1 + i_{\text{eff}} = \left(1 + \frac{0,087}{12}\right)^{12}$$

$$\therefore 1 + i_{\text{eff}} = 1,09055\dots$$

$$\therefore i_{\text{eff}} = 0,09055\dots$$

$$\approx 9,06\% <$$

6.2.1 Die waarde van die skootrekenaar daal tot R0:

$$P = R10\,000$$
 ; $n?$; $i = 0,2$; $A = R0$

$$A = P(1 - in) \Rightarrow 0 = 10\,000(1 - 0,2n)$$

$$\therefore 0 = 1 - 0,2n$$

$$\therefore 0,2n = 1$$

$$\therefore n = \frac{1}{0,2}$$

$$\therefore n = 5 \text{ jaar } <$$



6.2.2 Nuwe skootrekenaar:

$$F_v = R20\,000$$
 ; $n = 60$; $i = \frac{8,7\%}{12} = \frac{0,087}{12}$

$$F_v = \frac{x[(1+i)^n - 1]}{i} \Rightarrow 20\,000 = \frac{x\left[\left(1 + \frac{0,087}{12}\right)^{60} - 1\right]}{\frac{0,087}{12}}$$

$$\therefore x = 267,2611\dots$$

$\therefore x = \mathbf{R267,27} <$... R267,26 sal 'n waarde net minder as R20 000 gee

6.3 $P_v = R1\,600\,000$; $i = \frac{11,2\%}{12}$; $x = 20\,000$; $n?$

$$P_v = \frac{x[1 - (1+i)^{-n}]}{i}$$

$$\therefore 1\,600\,000 = \frac{20\,000\left[1 - \left(1 + \frac{11,2\%}{12}\right)^{-n}\right]}{\frac{11,2\%}{12}}$$

$$\therefore 80 = \frac{1 - \left(1 + \frac{0,112}{12}\right)^{-n}}{\frac{0,112}{12}}$$

$$\left(\times \frac{0,112}{12}\right) \therefore \frac{56}{75} = 1 - \left(1 + \frac{0,112}{12}\right)^{-n}$$

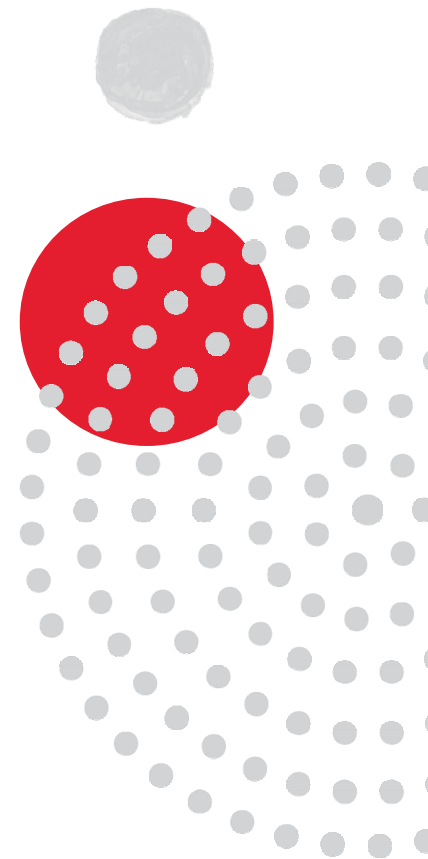
$$\therefore \left(1 + \frac{0,112}{12}\right)^{-n} = 1 - \frac{56}{75}$$

$$\therefore -n = \log_{\left(1 + \frac{0,112}{12}\right)} \frac{19}{75}$$

$$= -147,79\dots$$

$$\therefore n = 147,79\dots$$

\therefore Hy sal 147 onttrekkings van R20 000 kan maak <



DIFFERENSIAALREKENE [37]

$$7.1 \quad f(x) = -4x^2$$

$$\therefore f(x+h) = -4(x+h)^2$$

$$= -4(x^2 + 2xh + h^2)$$

$$= -4x^2 - 8xh - 4h^2$$

$$\therefore f(x+h) - f(x) = -8xh - 4h^2$$

$$\therefore \frac{f(x+h) - f(x)}{h} = -8x - 4h$$

$$\therefore f'(x) = \lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}$$

def van 'n afgeleide

$$= \lim_{h \rightarrow 0} (-8x - 4h)$$

$$= -8x <$$

$$\left[\begin{aligned} \text{OF: } f'(x) &= \lim_{h \rightarrow 0} \frac{-4(x+h)^2 - (-4x^2)}{h} \\ &= \lim_{h \rightarrow 0} \frac{-4x^2 - 8xh - 4h^2 + 4x^2}{h} \\ &= \lim_{h \rightarrow 0} \frac{-8xh - 4h^2}{h} \\ &= \lim_{h \rightarrow 0} (-8x - 4h) \\ &= -8x \end{aligned} \right]$$

$$7.2.1 \quad f(x) = 2x^3 - 3x$$

$$\therefore f'(x) = 6x^2 - 3 <$$

$$7.2.2 \quad D_x(7 \cdot x^{\frac{2}{3}} + 2x^{-5})$$

$$= 7 \cdot \frac{2}{3} x^{-\frac{1}{3}} + 2 \cdot -5x^{-6}$$

$$= \frac{14}{3} \cdot x^{-\frac{1}{3}} - 10x^{-6} <$$

$$\left[\begin{aligned} &= \frac{14}{3x^{\frac{1}{3}}} - \frac{10}{x^6} < \\ &= \frac{14}{3\sqrt[3]{x}} - \frac{10}{x^6} < \end{aligned} \right]$$



7.3

Die raaklyn aan 'n grafiek:

Die gradiënt van die raaklyn aan 'n grafiek f is die afgeleide, $f'(x)$

$$f(x) = -2x^3 + 8x$$

$$\therefore \text{Die gradiënt van die raaklyn} = f'(x) = -6x^2 + 8$$

$$f'(x) > 0 \Rightarrow -6x^2 + 8 > 0$$

Die grafiek van $y = f'(x)$:

$$\text{Die wortels: } -6x^2 + 8 = 0$$

$$\therefore 6x^2 - 8 = 0$$

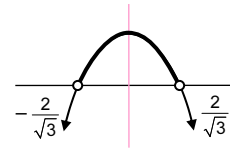
$$\therefore 6x^2 = 8$$

$$\therefore x^2 = \frac{4}{3}$$

$$\therefore x = \pm \frac{2}{\sqrt{3}}$$

$$\therefore -\frac{2}{\sqrt{3}} < x < \frac{2}{\sqrt{3}} <$$

$$\left[\text{of } -1,15 < x < 1,15 < \right]$$



NOTAS



$$8.1 \quad f(x) = -x^3 + 6x^2 - 9x + 4 = (x-1)^2(-x+4)$$

By die draaipunte, $f'(x) = 0$

$$\therefore f'(x) = -3x^2 + 12x - 9 = 0$$

$$+(-3): \therefore x^2 - 4x + 3 = 0$$

$$\therefore (x-1)(x-3) = 0$$

$$\therefore x = 1 \text{ of } 3$$

$$f(1) = (1-1)^2(-1+4) = 0$$

$$\& f(3) = (3-1)^2(-3+4) = 4$$

\therefore Draaipunte is (1; 0) en (3; 4) <

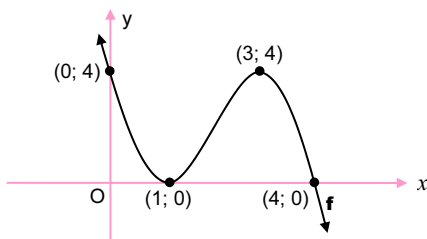
$$8.2 \quad \text{Y-afsnit: } f(0) = 4$$

$$(x=0) \therefore (0; 4)$$

$$\text{X-afsnitte: } (x-1)^2(-x+4) = 0$$

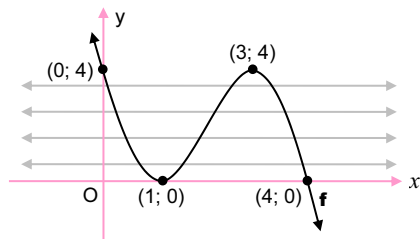
$$(y=0) \therefore x = 1 \text{ ('twee keer': dit is ook 'n draaipunt) of } x = 4$$

$$\therefore (1; 0) \text{ en } (4; 0)$$



$$8.3 \quad 0 < k < 4 <$$

$y = k$ kan (die vgl van) enige van hierdie grys lyne wees. Hulle sny almal vir f by 3 duidelike punte.



$$8.4 \quad \text{By die buigpunt: } f''(x) = 0$$

$$\therefore f''(x) = -6x + 12 = 0$$

$$\therefore -6x = -12$$

$$\therefore x = 2$$

$$f(2) = 2$$

\therefore Die buigpunt is (2; 2) <

Die gradiënt van die raaklyn aan f ,

$$a = f'(2) = -3(2)^2 + 12(2) - 9$$

$$= -12 + 24 - 9$$

$$= 3$$

Stel $a = 3$ en $(2; 2)$ in $y = ax + b$ in:

$$\therefore 2 = (3)(2) + b \quad \left(\begin{array}{l} \text{of } y - y_1 = m(x - x_1) \\ \therefore y - 2 = 3(x - 2), \text{ ens.} \end{array} \right)$$

$$\therefore b = -4$$

\therefore Die vergelyking van g : $y = 3x - 4$ <

$$8.5 \quad \tan \theta = 3 \quad \dots \text{ die gradiënt van } g$$

$$\therefore \theta = 71,57^\circ <$$



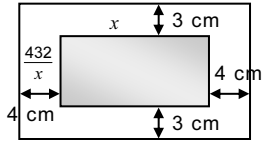
NOTAS



9.1 Die oppervlakte van reghoek ABCD:

$$x \times AB = 432 \text{ cm}^2$$

$$\therefore AB = \frac{432}{x} \text{ cm}$$



$$\begin{aligned} \therefore \text{Die totale oppervlakte} &= (x+8)\left(\frac{432}{x} + 6\right) \\ &= 432 + 6x + \frac{3\,456}{x} + 48 \\ &= \frac{3\,456}{x} + 6x + 480 \end{aligned}$$

9.2 Die totale oppervlakte, $A = 3\,456x^{-1} + 6x + 480$

Vir minimum waarde, $\frac{dA}{dx} = 0$

$$\therefore -3\,456x^{-2} + 6 = 0$$

$$\therefore -\frac{3\,456}{x^2} = -6$$

$$\times(-x^2) \quad \therefore 3\,456 = 6x^2$$

$$(+6) \quad \therefore 576 = x^2$$

$$\therefore x = 24 \text{ cm} \quad \dots x > 0$$

NOTAS



WAARSKYNNLIKHEID [15]

10.1.1 Vir onafhanklike gebeurtenisse, A en B:

$$\begin{aligned} P(A \text{ en } B) &= P(A) \times P(B) \\ &= \frac{1}{3} \times \frac{3}{4} \\ &= \frac{1}{4} \leftarrow \end{aligned}$$

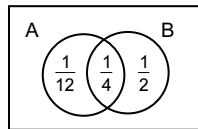
10.1.2 P(ten minste EEN gebeurtenis vind plaas)

$$\begin{aligned} &= P(A \text{ of } B) \\ &= P(A) + P(B) - P(A \text{ en } B) \\ &= \frac{1}{3} + \frac{3}{4} - \frac{1}{4} \\ &= \frac{5}{6} \leftarrow \end{aligned}$$

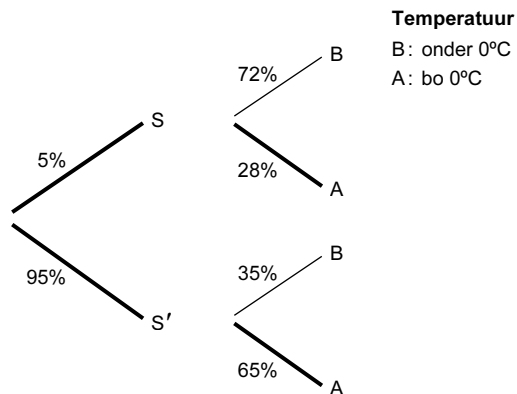


OF: P(ten minste EEN gebeurtenis vind plaas)

$$\begin{aligned} &= \frac{1}{12} + \frac{1}{4} + \frac{1}{2} \\ &= \frac{5}{6} \leftarrow \end{aligned}$$



10.2.1



$$\begin{aligned} 10.2.2 \quad P(A) &= P(S \text{ en } A) + P(S' \text{ en } A) \\ &= 5\% \times 28\% + 95\% \times 65\% \\ &= 1,4\% + 61,75\% \\ &= 63,15\% \leftarrow \end{aligned}$$

10.3.1 Aantal maniere: $\underline{10} \underline{9} \underline{8} \underline{7} \underline{6} \underline{5} \underline{4} \underline{3} \underline{2} \underline{1}$
 $\therefore 10! = 3\,628\,800 \leftarrow$

10.3.2 Die jongste leeders met 5 leeders tussenin.

$$\underline{2} \underline{8} \underline{7} \underline{6} \underline{5} \underline{4} \underline{1}$$

Dink aan die twee jongste leeders en 5 leeders tussenin as een eenheid. Rangskik dus 4 'groepe', d.w.s. 4!

$$\begin{aligned} \text{aantal maniere} &= 4! \times (2 \times 8 \times 7 \times 6 \times 5 \times 4 \times 1) \\ &= 322\,560 \end{aligned}$$

$$\begin{aligned} \therefore \text{WAARSKYNNLIKHEID} &= \frac{322\,560}{3\,628\,800} \dots P(E) = \frac{n(E)}{n(S)} \\ &= \frac{4}{45} \leftarrow \end{aligned}$$

OF:

$$\begin{aligned} &\underline{2} \times \underline{8} \times \underline{7} \times \underline{6} \times \underline{5} \times \underline{4} \times \underline{1} \times \underline{3} \times \underline{2} \times \underline{1} \\ &\underline{8} \times \underline{2} \times \underline{7} \times \underline{6} \times \underline{5} \times \underline{4} \times \underline{3} \times \underline{1} \times \underline{2} \times \underline{1} \\ &\underline{8} \times \underline{7} \times \underline{2} \times \underline{6} \times \underline{5} \times \underline{4} \times \underline{3} \times \underline{2} \times \underline{1} \times \underline{1} \\ &\underline{8} \times \underline{7} \times \underline{6} \times \underline{2} \times \underline{5} \times \underline{4} \times \underline{3} \times \underline{2} \times \underline{1} \times \underline{1} \end{aligned}$$

$$\begin{aligned} \therefore \text{WAARSKYNNLIKHEID} &= \frac{4 \times 2 \times 8!}{10!} \dots P(E) = \frac{n(E)}{n(S)} \\ &= \frac{4}{45} \leftarrow \end{aligned}$$

OF:

$$P(\text{enige een van twee jongste leeders}) = \frac{2}{10}$$



$$P(\text{ander jongste leerder}) = \frac{1}{9}$$

Jongste leeders kan in posisies 1 en 7 wees, of 2 en 8, of 3 en 9, of 4 en 10.

$$\begin{aligned} \therefore \text{WAARSKYNNLIKHEID} &= \frac{2}{10} \times \frac{1}{9} \times 4 \\ &= \frac{4}{45} \leftarrow \end{aligned}$$

