

GETALPATRONE EN RYE

OEFENING 3.3

MEMORANDUM

1. Tot dusver het jy die formule $T_n = pn + q$ gebruik.

Die handboek maak nou melding van die volgende formule $T_n = a + (n - 1)d$ wat spesifiek is vir 'n Rekenkundige ry. 'n Rekenkundige ry is niks anders as 'n ry met 'n konstante verskil nie.

$a \rightarrow$ waarde van jou eerste term

$d \rightarrow$ konstante verskil

Enige een van die twee formules kan gebruik word.

- a) $T_n = pn + q$ $T_n = a + (n - 1)d$
- $T_n = 4n + q$ $T_n = 7 + (n - 1)4$
- $T_1 = 4(1) + q$ OF $T_n = 7 + 4n - 4$
- $7 = 4(1) + q$ $T_n = 4n + 3$
- $3 = q$ **$T_{10} = 4(10) + 3 = 43$**
- $T_n = 4n + 3$ **$T_{21} = 4(21) + 3 = 87$**
-
- b) $T_n = pn + q$ $T_n = a + (n - 1)d$
- $T_n = 5n + q$ $T_n = -4 + (n - 1)5$
- $T_1 = 5(1) + q$ OF $T_n = -4 + 5n - 5$
- $-4 = 5(1) + q$ $T_n = 5n - 9$
- $-9 = q$ **$T_{10} = 5(10) - 9 = 41$**
- $T_n = 5n - 9$ **$T_{21} = 5(21) - 9 = 96$**

c) $T_n = pn + q$ $T_n = a + (n - 1)d$

$T_n = -4n + q$ $T_n = 23 + (n - 1)(-4)$

$T_1 = -4(1) + q$ OF $T_n = 23 - 4n + 4$

$23 = -4(1) + q$ $T_n = -4n + 27$

$27 = q$ **$T_{10} = -4(10) + 27 = -13$**

$T_n = -4n + 28$ **$T_{21} = -4(21) + 27 = -57$**

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

$T_n = 1.25n + q$ $T_n = 1,25 + (n - 1)1,25$

$T_1 = 1.25(1) + q$ OF $T_n = 1,25 + 1,25n - 1,25$

$1,25 = 1,25(1) + q$ $T_n = 1,25n$

$0 = q$ **$T_{10} = 1,25(10) = 12,5$**

$T_n = 1,25n$ **$T_{21} = 1.25(21) = 26,25$**

e) $T_n = pn + q$ $T_n = a + (n - 1)d$

$T_n = 0,75n + q$ $T_n = 0,75 + (n - 1)0,75$

$T_1 = 0,75(1) + q$ OF $T_n = 0,75 + 0,75n - 0,75$

$0,75 = 0,75(1) + q$ $T_n = 0,75n$

$0 = q$ **$T_{10} = 0,75(10) = 7,5$**

$T_n = 0,75n$ **$T_{21} = 0,75(21) = 15,75$**

f) $T_n = pn + q$ $T_n = a + (n - 1)d$

$T_n = \frac{3}{4}n + q$ $T_n = -\frac{3}{8} + (n - 1)\frac{3}{4}$

$T_1 = \frac{3}{4}(1) + q$ OF $T_n = -\frac{3}{8} + \frac{3}{4}n - \frac{3}{4}$

$-\frac{3}{8} = \frac{3}{4}(1) + q$ $T_n = \frac{3}{4}n - \frac{9}{8}$

$-\frac{9}{8} = q$ **$T_{10} = \frac{3}{4}(10) - \frac{9}{8} = \frac{51}{8}$**

$T_n = \frac{3}{4}n - \frac{9}{8}$ **$T_{21} = \frac{3}{4}(21) - \frac{9}{8} = \frac{51}{8}$**

SAKREKENAARS!!!!

g) $T_n = pn + q$ $T_n = a + (n - 1)d$

$T_n = \frac{1}{2}n + q$ $\frac{7}{6} - \frac{2}{3} = \frac{1}{2}$ $T_n = \frac{2}{3} + (n - 1)\frac{1}{2}$

$T_1 = \frac{1}{2}(1) + q$ OF $T_n = \frac{2}{3} + \frac{1}{2}n - \frac{1}{2}$

$\frac{2}{3} = \frac{1}{2}(1) + q$ $T_n = \frac{1}{2}n + \frac{1}{6}$

$\frac{1}{6} = q$ **SAKREKENAARS!!!!** **$T_{10} = \frac{1}{2}(10) + \frac{1}{6} = \frac{31}{6}$**

$T_n = \frac{1}{2}n + \frac{1}{6}$ **$T_{21} = \frac{1}{2}(21) + \frac{1}{6} = \frac{32}{3}$**

h) $T_n = pn + q$ $T_n = a + (n - 1)d$

$T_n = 3n + q$ $T_n = -3 + (n - 1)3$

$T_1 = 3(1) + q$ OF $T_n = -3 + 3n - 3$

$-3 = 3(1) + q$ $T_n = 3n - 6$

$-6 = q$ **$T_{10} = 3(10) - 6 = 24$**

$T_n = 3n - 6$ **$T_{21} = 3(21) - 6 = 57$**

JY KAN ENIGE EEN VAN DIE TWEE METODEDES GEBRUIK.

JY HOEF NIE SO BAIE STAPPE TE TOON NIE.

2. Om aan te toon dat 'n ry rekenkundig is, moet jy bewys dat daar 'n konstante verskil tussen die terme is.

a) $T_2 - T_1 = 5 - 3 = 2$

$T_3 - T_2 = 7 - 5 = 2$

Die ry is Rekenkundig met 'n konstante verskil van 2.

b) $T_2 - T_1 = 2x + 7 - (x + 9) = 2x + 7 - x - 9 = x - 2$

$T_3 - T_2 = 3x + 5 - (2x + 7) = 3x + 5 - 2x - 7 = x - 2$

Die ry is Rekenkundig met 'n konstante verskil van $x - 2$.

$$c) \quad T_2 - T_1 = 5x^2 - 2x - (3x^2 - 4x) = 5x^2 - 2x - 3x^2 + 4x = 2x^2 + 2x$$

$$T_3 - T_2 = 7x^2 - (5x^2 - 2x) = 7x^2 - 5x^2 + 2x = 2x^2 + 2x$$

Die ry is Rekenkundig met 'n konstante verskil van $2x^2 + 2x$

$$d) \quad T_2 - T_1 = -\frac{11}{8} - \left(-\frac{7}{4}\right) = \frac{3}{8}$$

$$T_3 - T_2 = -1 - \left(-\frac{11}{8}\right) = \frac{3}{8}$$

SAKREKENAARS!!!!!!!

Die ry is Rekenkundig met 'n konstante verskil van $\frac{3}{8}$

3. Jy kan nou besluit watter formule jy wil gebruik:

$$T_n = pn + q$$

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

$$T_n = 2n + q$$

$$T_n = 3 + (n - 1)2 \quad T_n = 27$$

$$T_1 = 2(1) + q$$

OF

$$27 = 3 + 2n - 2$$

$$3 = 2(1) + q$$

$$26 = 2n$$

$$1 = q$$

$$13 = n$$

$$T_n = 2n + 1$$

13de term.

$$T_n = 27$$

KORTER METODE.

$$27 = 2n + 1$$

$$26 = 2n$$

$$13 = n$$

13de Term.

$$4. \quad T_n = pn + q$$

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

$$T_n = 5n + q$$

$$T_n = -4 + (n - 1)5 \quad T_n = 56$$

$$T_1 = 5(1) + q$$

OF

$$56 = -4 + 5n - 5$$

$$-4 = 5(1) + q$$

$$65 = 5n$$

$$-9 = q$$

$$13 = n$$

$$T_n = 5n - 9$$

13de term.

$$T_n = 56$$

$$56 = 5n - 9$$

$$65 = 5n$$

$$13 = n$$

13de Term.

5. $T_n = pn + q$

$$T_n = -4n + q$$

$$T_1 = -4(1) + q$$

OF

$$23 = -4(1) + q$$

$$27 = q$$

$$T_n = -4n + 27$$

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

$$T_n = 23 + (n - 1)(-4)$$

$$T_n = 23 - 4n + 4$$

$$T_n = -4n + 27$$

a) $T_{12} = -4(12) + 27$

OF

$$T_{12} = -21$$

$$T_{12} = 23 + (12 - 1)(-4)$$

$$T_{12} = 23 + (11)(-4)$$

$$T_{12} = -21$$

b) $T_n = -53$

OF

$$-53 = -4n + 27$$

$$-80 = -4n$$

$$20 = n$$

20ste Term.

$$T_n = 23 + (n - 1)(-4) \quad T_n = -53$$

$$-53 = 23 - 4n + 4$$

$$-80 = -4n$$

$$20 = n$$

20ste Term

6. $T_n = pn + q$

$$T_n = 1,5n + q$$

$$T_1 = 1,5(1) + q$$

OF

$$2 = 1,5(1) + q$$

$$0,5 = q$$

$$T_n = 1,5n + 0,5$$

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

$$T_n = 2 + (n - 1)1,5$$

$$T_n = 2 + 1,5n - 1,5$$

$$T_n = 1,5n + 0,5$$

a)	$T_{53} = 1,5(53) + 0,5$	OF	$T_{53} = 2 + (53 - 1)1,5$
	$T_{12} = 80$		$T_{53} = 2 + (52)(1,5)$
			$T_{53} = 80$
b)	$T_n = 53$	OF	$T_n = 2 + (n - 1)1,5 \quad T_n = 53$
	$53 = 1,5n + 0,5$		$53 = 2 + 1,5n - 1,5$
	$52,5 = 1,5n$		$52,5 = 1,5n$
	$35 = n$		$35 = n$
	35ste Term.		35ste Term

GETALPATRONE EN RYE

OEFENING 3.4

MEMORANDUM

1. a) (i) 4 vuurhoutjies
(ii) 7 vuurhoutjies
(iii) 10 vuurhoutjies
- b) 4; 7; 10; 13; 16; 19; 22; 25; 28; **31**
- c) $T_n = pn + q$ $T_n = a + (n - 1)d$
 $T_n = 3n + q$ $T_n = 4 + (n - 1)3$
 $T_1 = 3(1) + q$ OF $T_n = 4 + 3n - 3$
 $4 = 3(1) + q$ $T_n = 3n + 1$
 $1 = q$
 $T_n = 3n + 1$

2. a) Totaal na 6 weke:

$$30 \text{ km} + 34 \text{ km} + 38 \text{ km} + 42 \text{ km} + 46 \text{ km} + 50 \text{ km} = 240 \text{ km}$$

b)

$$T_n = pn + q \qquad T_n = a + (n - 1)d$$

$$T_n = 4n + q \qquad T_n = 30 + (12 - 1)4$$

$$T_1 = 4(1) + q \qquad \text{OF} \qquad T_n = 30 + 4(11) = 74 \text{ km}$$

$$30 = 4(1) + q$$

$$26 = q$$

$$T_n = 4n + 26$$

$$T_{12} = 4(12) + 26 = 74 \text{ km}$$

Hierdie vraag is baie dubbelsinnig. "...in die week nadat hy 12 weke se oefening..." kan jy moontlik interpreteer as die afstand wat hy in die 13de week aflê OF die afstand wat hy aan die einde van die 12de week sal aflê. Die handboek se antwoord word gegee na gelang van die tweede interpretasie.

3. a)

Aantal seshoeke	1	2	3	4	5	6	7
Aantal tandestokkies, C	6	11	16	21	26	31	36

- b) (i) 41 seshoeke
- c) (ii) 41; 46; 51; 56; 61; 66; 71; 76; **81**
- 81 seshoeke

d)

$$T_n = pn + q \qquad T_n = a + (n - 1)d$$

$$T_n = 5n + q \qquad T_n = 6 + (n - 1)5$$

$$T_1 = 4(1) + q \qquad \text{OF} \qquad T_n = 6 + 5n - 5$$

$$6 = 5(1) + q \qquad T_n = 5n + 1$$

$$1 = q$$

$$T_n = 5n + 1$$

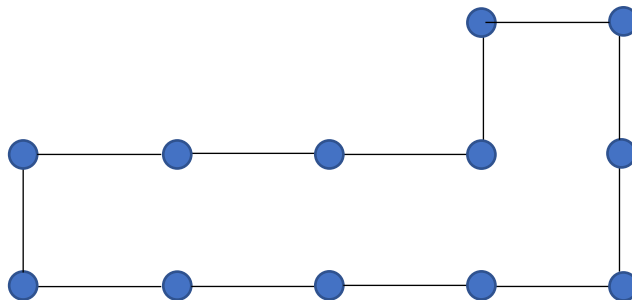
4. a) Patroon 1 → 5 teëls
 Patroon 2 → 9 teëls
 Patroon 3 → 13 teëls

- b) 13; 17; 21; **25**
 25 teëls

c) $T_n = pn + q$ $T_n = a + (n - 1)d$
 $T_n = 4n + q$ $T_n = 5 + (n - 1)4$
 $T_1 = 4(1) + q$ OF $T_n = 5 + 4n - 4$
 $5 = 4(1) + q$ $T_n = 4n + 1$
 $1 = q$

d) $T_n = 4n + 1$ $T_n = 41$
 $41 = 4n + 1$
 $40 = 4n$
 $10 = n$ $k = 10$

5. a)



- b)

Lengte van die basis, n	Aantal vuurhoutjies, T_n
1	6
2	8

3	10
4	12
5	14
6	16

c) $T_n = pn + q$ $T_n = a + (n - 1)d$
 $T_n = 2n + q$ $T_n = 6 + (n - 1)2$
 $T_1 = 2(1) + q$ OF $T_n = 6 + 2n - 2$
 $6 = 2(1) + q$ $T_n = 2n + 4$
 $4 = q$
 $T_n = 2n + 4$

d) $T_n = 2n + 4$
 $T_{20} = 2(20) + 4$
 $T_{20} = 44$

6. a) 14 mense

b) $T_n = pn + q$ $T_n = a + (n - 1)d$
 $T_n = 4n + q$ $T_n = 6 + (n - 1)4$
 $T_1 = 4(1) + q$ OF $T_n = 6 + 4n - 4$
 $6 = 4(1) + q$ $T_n = 4n + 2$
 $2 = q$
 $T_n = 4n + 2$

c) Die reeks word 6; 8; 10.

d) $T_n = pn + q$ $T_n = a + (n - 1)d$
 $T_n = 2n + q$ $T_n = 6 + (n - 1)2$
 $T_1 = 2(1) + q$ OF $T_n = 6 + 2n - 2$
 $6 = 2(1) + q$ $T_n = 2n + 4$
 $T_n = 2n + 4$

7. a) $T_n = pn + q$ $T_n = a + (n - 1)d$
 $T_n = 10n + q$ $T_n = 40 + (n - 1)10$
 $T_1 = 10(1) + q$ OF $T_n = 40 + 10n - 10$
 $40 = 10(1) + q$ $T_n = 10n + 30$
 $T_n = 10n + 30$

b) $T_n = 10n + 30$
 $T_{12} = 10(12) + 30 = 150 \text{ km}$

8. a) 1 400; 1 440; 1 480; 1 520

b) $T_n = pn + q$ $T_n = a + (n - 1)d$
 $T_n = 40n + q$ $T_n = 1 400 + (n - 1)40$
 $T_1 = 40(1) + q$ OF $T_n = 1 400 + 40n - 40$
 $1400 = 40(1) + q$ $T_n = 40n + 1 360$
 $T_n = 40n + 1 360$

c) $T_n = 40n + 1 360$
 $T_{12} = 40(12) + 1 360 = R 1 840$

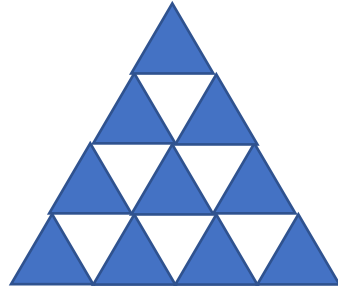
d) $\frac{1840-1400}{1400} \times 100 = 31,43\%$

9. a) 2; 4; 6 \rightarrow 6 km

b) $T_n = pn + q$ $T_n = a + (n - 1)d$
 $T_n = 2n + q$ $T_n = 2 + (n - 1)2$
 $T_1 = 2(1) + q$ OF $T_n = 2 + 2n - 2$
 $2 = 2(1) + q$ $T_n = 2n$
 $T_n = 2n$

c) $T_{30} = 2(30) = 60 \text{ km}$

10. a)



b) 1; 4; 9; 16; 25 → 25 driehoeke

c) Die reeks is vierkantsgetalle.....

$$T_n = n^2$$

11. Patroon 1 het 12 vuurhoutjies.

Patroon 2 het 19 vuurhoutjies.

Patroon 3 sal 26 vuurhoutjies hê.

Elke patroon voeg 3 vuurhoutjies by om 'n vierkant te vorm plus 4 vuurhoutjies om die driehoeke te vorm.

Dit gee 'n totaal van 7 vuurhoutjies wat vir elke nuwe patroon bygevoeg word.

Dit is 'n rekenkundige ry: $T_n = 7n + 5$

DIE EINDE 😊

Laastens, onthou dat jou metodes nie noodwendig 100% met my metodes sal ooreenstem nie. Ons almal se denkpatrone en redenasievermoëns verskil. Ek het sover moontlik verkeie metodes probeer gee.