

**November Vraestel 1, 2021 - Memorandum****VRAAG 1**

$$\begin{aligned} 1.1.1 \quad & -\frac{2}{x} \left(2x - \frac{xy}{2}\right)^2 & (3) \\ & = -\frac{2}{x} \left(4x^2 - 2x^2y\checkmark + \frac{x^2y^2}{4}\checkmark\right) \\ & = -8x + 4xy - \frac{xy^2}{2}\checkmark \end{aligned}$$

$$\begin{aligned} 1.1.2 \quad & \frac{-y(6+y)}{y^3-27} + \frac{1}{3-y} & (5) \\ & = \frac{-6y-y^2}{(y-3)(y^2+3y+9)\checkmark} - \frac{1}{(y-3)}\checkmark \\ & = \frac{-6y-y^2\checkmark - y^2-3y-9\checkmark}{(y-3)(y^2+3y+9)} \\ & = \frac{-2y^2-9y-9}{(y-3)(y^2+3y+9)}\checkmark \end{aligned}$$

$$\begin{aligned} 1.1.3 \quad & \frac{4^x + 2^{2x-2}}{0.5^{1-2x}} & (5) \\ & = \frac{2^{2x}\checkmark + 2^{2x-2}}{2^{-1+2x}\checkmark} \\ & = \frac{2^{2x}(1+2^{-2})\checkmark}{2^{2x} \cdot 2^{-1}} \\ & = \frac{1+\frac{1}{4}}{\frac{1}{2}}\checkmark \\ & = \frac{5}{2}\checkmark \end{aligned}$$

$$\begin{aligned} 1.2.1 \quad & 6a^2 - 7a + 2 & (2) \\ & = (2a-1)\checkmark(3a-2)\checkmark \end{aligned}$$

$$\begin{aligned} 1.2.2 \quad & a^3 - 9a - 2a^2 + 18 & (4) \\ & = a^3 - 2a^2 - 9a + 18 \\ & = a^2(a-2)\checkmark - 9(a-2)\checkmark \\ & = (a-2)(a^2-9)\checkmark \\ & = (a-2)(a-3)(a+3)\checkmark \end{aligned}$$

$$\begin{aligned} 1.2.3 \quad & a^2 - \frac{4}{\sqrt{b^{18}}} & (3) \\ & = a^2 - \frac{4}{b^9}\checkmark \\ & = \left(a - \frac{2}{\sqrt{b^9}}\right)\checkmark \left(a + \frac{2}{\sqrt{b^9}}\right)\checkmark \end{aligned}$$

$$\begin{aligned} 1.3 \quad & (2a-3b)^2 & (2) \\ & = 4a^2 - 12ab + 9b^2\checkmark \\ & = 16 + 10 \\ & = 26\checkmark & [24] \end{aligned}$$

VRAAG 2

- 2.1 $4^x = \sqrt[4]{2^y}$ (5)
- $$2^{2x} = 2^{\frac{y}{4}} \checkmark$$
- $$2x = \frac{y}{4}$$
- $$8x = y \dots (1) \checkmark$$
- Stel (1) in (2)
- $$4x + 2(8x) = 20 \checkmark$$
- $$20x = 20$$
- $$x = 1 \checkmark$$
- $$\therefore 4(1) + 2y = 20$$
- $$y = 8 \checkmark$$
- 2.2.1 $2 + \frac{2x}{2-x} = \frac{x-5}{x-2}$ (3)
- $$2(x-2) - 2x \checkmark = x-5 \checkmark$$
- $$2x - 4 - 2x = x - 5$$
- $$x = 1 \checkmark$$
- 2.2.2 $\frac{9}{x} = 4x$ (4)
- $$9 = 4x^2$$
- $$0 = 4x^2 - 9 \checkmark$$
- $$0 = (2x-3)(2x+3) \checkmark$$
- $$0 = (2x-3) \text{ of } 0 = (2x+3) \checkmark$$
- $$x = \pm \frac{3}{2} \checkmark$$
- 2.2.3 $-2 \leq \frac{\frac{1}{2}x-2}{4} \leq 4$ (3)
- $$-8 \leq \frac{1}{2}x - 2 \leq 16 \checkmark$$
- $$-6 \leq \frac{1}{2}x \leq 18 \checkmark$$
- $$-12 \leq x \leq 36 \checkmark$$
- 2.2.4 $P = 3\sqrt[3]{xR}$ (3)
- $$\frac{(\frac{P}{3\sqrt[3]{R}})^3 \checkmark}{R \checkmark} = x$$
- [18]

VRAAG 3

- 3.1 $T_n = \frac{n^2}{n+5} \checkmark$ (1)
- 3.2 $4x + 3 - 2x \checkmark = x + 6 - (4x + 3) \checkmark$ (3)
- $$4x + 3 - 2x = x + 6 - 4x - 3$$
- $$3x = 0$$
- $$x = 0 \checkmark$$

$$3.3.1 \quad T_n = 2n + 2 \quad (1)$$

$$3.3.2 \quad \begin{aligned} 144 &= 2n + 2 \\ 142 &= 2n \\ 71 &= n \end{aligned} \quad (2)$$

$$3.3.3 \quad 4 \quad (1)$$

$$3.3.4 \quad 2022 \quad (1)$$

[9]

VRAAG 4

$$4.1 \quad A = P(1 + i)^n \quad (3)$$

$$1500 = P(1 + \frac{5,5}{100})^5$$

$$\frac{1500}{(1 + \frac{5,5}{100})^5} = P$$

$$P = R11\,477,02$$

$$4.2 \quad A = P(1 + i)^n \quad (4)$$

$$2x = x(1 + i)^4$$

$$2 = (1 + i)^4$$

$$\sqrt[4]{2} - 1 = \frac{r}{100}$$

$$18,92\% = r$$

$$4.3 \quad A = 12\,350(1 + \frac{12}{100})^3 - 2500(1 + \frac{12}{100})^9 + 5000(1 + \frac{10}{100})^7 \quad (8)$$

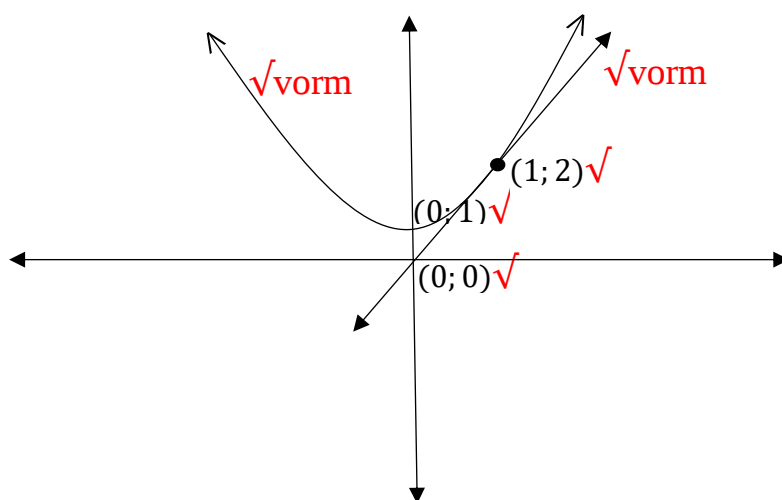
$$+ 5000(1 + \frac{10}{100})^7$$

$$A = R\,44\,053,75$$

[15]

VRAAG 5

$$5.1.1 \quad (5)$$



$$5.1.2 \quad h(2) = 2(2) = 4 \quad (1)$$

$$g(4) = 4^2 + 1 = 17$$

$$5.1.3 \quad -h\left(\frac{g(x)}{x}\right) = -2\left(\frac{x^2+1}{x}\right) \quad (2)$$

$$= -2x - \frac{2}{x} \checkmark$$

Stel in $x = -2$:

$$= -2(-2) - \frac{2}{(-2)}$$

$$= 5 \checkmark$$

$$5.1.4 \quad -k(x) = x^2 + 1 \quad (2)$$

$$k(x) = -x^2 \checkmark -1 \checkmark$$

[10]

VRAAG 6

$$6.1 \quad f(x) = a \cdot b^x \quad (3)$$

Stel in $(0; 2)$:

$$2 = a \cdot b^0$$

$$2 = a \checkmark$$

$$f(x) = 2b^x$$

Stel in $(1; 6)$:

$$6 = 2b^1$$

$$3 = b \checkmark$$

$$f(x) = 2(3)^x \checkmark$$

$$6.2 \quad g(x) = \frac{p}{x} + q \quad (4)$$

Stel in $(4; 0)$:

$$0 = \frac{p}{4} + q$$

$$-q = \frac{p}{4}$$

$$-4q = p \checkmark \dots (1)$$

$$g(x) = \frac{p}{x} + q$$

Stel in $(1; 6)$:

$$6 = p + q \dots (2)$$

Stel (1) in (2):

$$6 = -4q + q \checkmark$$

$$6 = -3q$$

$$-2 = q \checkmark$$

$$\therefore p = 8 \checkmark$$

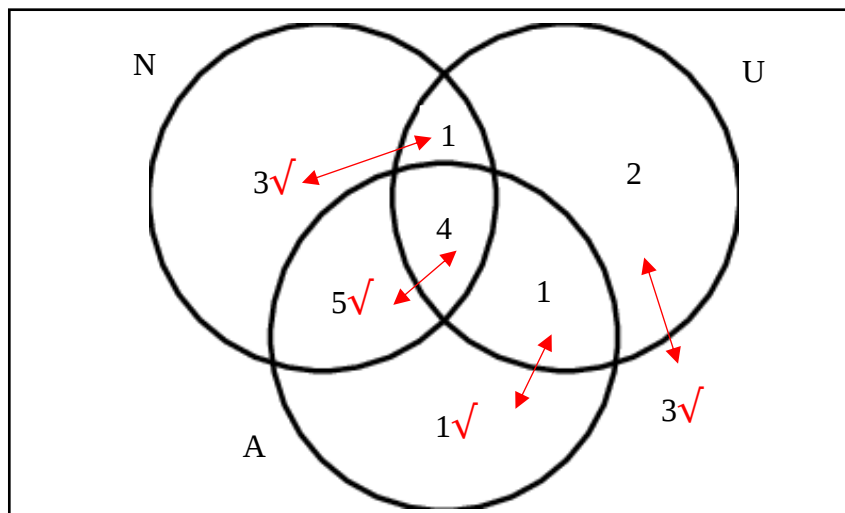
$$6.3 \quad y \in R; y \neq -2 \checkmark \quad (1)$$

[8]

VRAAG 7

7.1.1

(4)



7.1.2.1 $n(\text{Slegs } N) = 3$ ✓ (1)

7.1.2.2 $P(U \cap A) = \frac{5}{20} = \frac{1}{4}$ ✓ (1)

7.1.2.3 $P(N/A) = \frac{9}{11}$ ✓ (1)

7.1.2.4 $P(N \cup U \cup A)' = \frac{3}{20}$ ✓ (1)

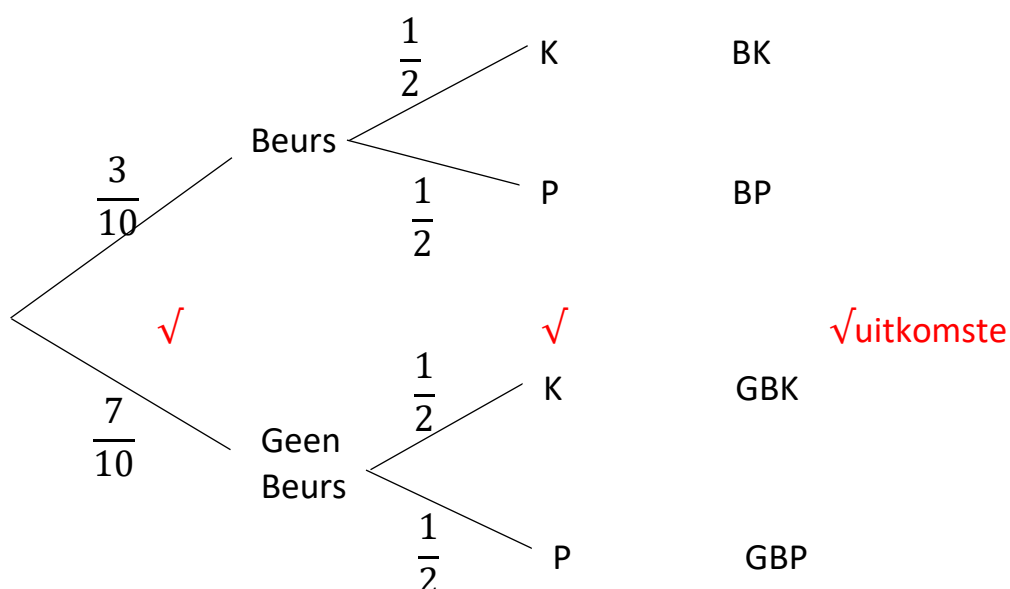
7.2 $P(X \cup Y) = P(X) + P(Y) - P(X \cap Y)$ (3)

$$0,575 = 0,4 + 0,35 - P(X \cap Y)$$

$$P(X \cap Y) = 0,175$$

$$P(X \cap Y)' = 1 - 0,175 = 0,825$$

7.3 (5)



$$P(BP) = \frac{3}{10} \times \frac{1}{2} = \frac{3}{20}$$

[16]

Totaal: [100]