



WISKUNDE / MATHEMATICS
Getalstelsels, getallelyne, produkte en faktorisering
Number systems, number lines, products and factorising

GRAAD / GRADE: 10
TYD / TIME: 40 MIN
EKSAMINATOR: M VILJOEN

DATUM / DATE: 9 Feb 2017
PUNTE / MARKS: 35
MODERATOR: G BELLINGAN

VRAAG 1

Bewys dat die volgende getalle
rasionaal is:

QUESTION 1

Prove that the following numbers
are rational:

- | | | |
|-----|------|-----|
| 1.1 | 0,25 | [1] |
| 1.2 | 0,25 | [4] |
| | | [5] |

VRAAG 2

Stel die volgende op 'n getallelyn
voor:

QUESTION 2

Represent the following on a
number line:

- | | | |
|-----|---|-----|
| 2.1 | $\{x : -3 < x \leq 2; x \in \mathbb{Z}\}$ | [2] |
| 2.2 | $(-\infty; 5]$ | [2] |
| 2.3 | $\{x : x \leq 4; x \in \mathbb{N}\}$ | [3] |
| | | [7] |

VRAAG 3

Bepaal die volgende produkte:

QUESTION 3

Determine the following products:

- | | | |
|-----|--|-----|
| 3.1 | $(x - 3y)(2x - 2y) - (x^2 - y)^2$ | [4] |
| 3.2 | $\left(\frac{1}{2}a^2 - \frac{1}{3a^2}\right)^2$ | [3] |
| | | [7] |

VRAAG 4

Faktoriseer volledig:

- | | | |
|-----|-----------------------------|------|
| 4.1 | $12x^3y^2 - 15x^2y^2 + 3xy$ | [2] |
| 4.2 | $16 - x^4y^4$ | [3] |
| 4.3 | $6a^2 - 3ab - 4ak + 2bk$ | [3] |
| 4.4 | $24x^4 + 3y^3x$ | [3] |
| 4.5 | $x^2 - x + y - y^2$ | [3] |
| | | [14] |

VRAAG 5

Bepaal die volgende:

QUESTION 4

Factorise completely:

$\sqrt{36x^2 - 24xy + 4y^2}$	[2]
------------------------------	-----

TOTAAL / TOTAL: [35]

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1.1. $0,25 = \frac{25}{100} = \frac{1}{4} \rightarrow$

1.2. $0,2\dot{5} = 0,25555\dots$

$\therefore x = 0,2555\dots$

$10x = 2,555\dots \quad \text{--- (1)}$

$100x = 25,555\dots \quad \text{--- (2)}$

$(2) - (1): 90x = 23$
 $x = \frac{23}{90} \rightarrow$

✓ antw.

(1) K.

✓ $10x = \dots$

✓ $100x = \dots$

✓ (2) - (1):

✓ ans.

/5/ (4) C

2.1. $\{x: -3 < x \leq 2; x \in \mathbb{Z}\}$



✓ ...

✓ correct nys.
 ✓ korrekte getalle

(2) R

2.2. $(-\infty; 5]$



✓ _____

✓ $\leftarrow + 5$

(2) R.

2.3. $\{x: x \leq 4; x \in \mathbb{N}\}$



✓ ...

✓ 1 2 3 4

✓ geen 0 by
 0 en neg getalle
 Not 0 or neg n

/7/ (3) C

3.1. $(x-3y)(2x-2y) - (x^2-y)^2$
 $= 2x^2 - 2xy - 6xy + 6y^2 - [x^4 - 2x^2y + y^2]$
 $= 2x^2 - 8xy + 6y^2 - x^4 + 2x^2y - y^2$
 $= 2x^2 - 8xy + 5y^2 - x^4 + 2x^2y \rightarrow$

✓ $2x^2 - 8xy + 6y^2$

✓ $-[x^4 - 2x^2y + y^2]$

✓ $-x^4 + 2x^2y - y^2$

✓ ans.

(4) R.

3.2. $(\frac{1}{2}a^2 - \frac{1}{3}a^2)(\frac{1}{2}a^2 - \frac{1}{3}a^2)$
 $= \frac{1}{4}a^4 - \frac{1}{6} - \frac{1}{6} + \frac{1}{9}a^4$
 $= \frac{1}{4}a^4 - \frac{1}{3} + \frac{1}{9}a^4 \rightarrow$

✓ $\frac{1}{4}a^4$

✓ $-\frac{1}{3}$

✓ $\frac{1}{9}a^4$

/7/ (3) C

$$4.1 \quad 12x^3y^2 - 15x^2y^2 + 3xy \\ = 3xy(4x^2y - 5xy + 1) \rightarrow$$

$$\checkmark 3xy \\ \checkmark (4x^2y - 5xy + 1) \\ (2) R.$$

$$4.2 \quad 16 - x^4y^4 \\ = (4 + x^2y^2)(4 - x^2y^2) \\ = (4 + x^2y^2)(2 + xy)(2 - xy) \rightarrow$$

$$\checkmark (4 + x^2y^2) \\ \checkmark (4 - x^2y^2) \\ \checkmark (2 + xy)(2 - xy) \\ (3) R$$

$$4.3 \quad 6a^2 - 3ab - 4ak + 2bk \\ = 3a(2a - b) - 2k(2a - b) \\ = (2a - b)(3a - 2k) \rightarrow$$

$$\checkmark 3a(2a - b) \\ \checkmark -2k(2a - b) \\ \checkmark (2a - b)(3a - 2k) \\ (3) R.$$

$$4.4 \quad 24x^4 + 3y^3x \\ = 3x(8x^3 + y^3) \\ = 3x(2x + y)(4x^2 - 2xy + y^2) \rightarrow$$

$$\checkmark 3x(8x^3 + y^3) \\ \checkmark (2x + y) \\ \checkmark (4x^2 - 2xy + y^2) \\ (3) R.$$

$$4.5 \quad x^2 - x + y - y^2 \\ = x^2 - y^2 - x + y \\ = (x + y)(x - y) - (x - y) \\ = (x - y)(x + y - 1) \rightarrow$$

$$\checkmark (x + y)(x - y) \\ \checkmark -(x - y) \\ \checkmark \text{ant.} \\ (3) C.$$

/14/

$$5 \quad \sqrt{36x^2 - 24xy + 4y^2} \\ = \sqrt{4(9x^2 - 6xy + y^2)} \\ = \sqrt{4(3x - y)(3x - y)} \\ = 2(3x - y) \rightarrow$$

$$\checkmark \sqrt{4(3x - y)^2} \\ \checkmark 2(3x - y) \\ (2) P.$$

/2/

//35//

K	P	C	P
1	19	13	2
3%	54%	37%	6% = 100%