GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

GAUTENG DEPARTMENT OF EDUCATION /

GAUTENGSE DEPARTEMENT VAN ONDERWYS

PROVINCIAL EXAMINATION / *PROVINSIALE EKSAMEN*

2016

GRADE / *GRAAD* 9

MATHEMATICS / *WISKUNDE*

MEMORANDUM

GAUTENG DEPARTMENT OF EDUCATION /

GAUTENGSE DEPARTEMENT VAN ONDERWYS

PROVINCIAL EXAMINATION / *PROVINSIALE EKSAMEN*

MATHEMATICS / *WISKUNDE*

QUESTION / *VRAAG* 1

1.1. C
1.2. B
1.3. A
1.4. C
1.5. A
1.6. A
1.7. B
1.8. B
1.9. C
1.10. B

1 Mark per correct answer

1 Punt per korrekte antwoord

(1)

QUESTION / *VRAAG* 2

2.1 $3x^3 - 2x^2 - 9x + 2$

$= 3(-2)^3 - 2(-2)^2 - 9(-2) + 2$

$= 3(-8) - 2(4) + 18 + 2$
$= -24 - 8 + 18 + 2$
$= -12$

1 Substitution / *Substitusie*
1 Answer / *Antwoord*

(2)

2.2

2.2.1. $3xy^2 - 5x^2y - 9xy^2 + 8x^2y - 3x^2$
$= -6xy^2 + 3x^2y - 3x^2$

1 Adding / *Optel*
$= 6xy^2$
1 Adding / Optel
$3x^2 - 3x^2$

(2)

2.2.2 $2^{x+y} \times 2^{x-y}$
$= 2^{x+y+x-y}$
$= 2^{2x}$

1 Answer / *Antwoord*

(1)

2.2.3 $\frac{-2pq\times(2p^2q^3)^2}{32p^6q^7}$

$=\frac{-2pq\times4p^4q^6}{32p^6q^7}$

$=\frac{-8p^5q^7}{32p^6q^7}$

$=-\frac{1}{4p}$

1 Multiplying with exponents into brackets

1 Law of Exponents / *Maal magte*

1 Answer / *Antwoord*

(3)

2.2.4 $(2x-4)(2x+4)$

$=4x^2-16$

1 Answer / *Antwoord* $4x^2$
1 Answer / *Antwoord* -16

(2)

2.3 $3{,}4\times10^{-3}+5{,}8\times10^{-5}$

$=3{,}4\times10^{-3}+0{,}058\times10^{-3}$
$=3{,}458\times10^{-3}$

1 for / *vir* $0{,}058\times10^{-3}$
1 for / *vir* $\times10^{-3}$

or / of

$3{,}4\times10^{-3}+5{,}8\times10^{-5}$
$=340\times10^{-5}+5{,}8\times10^{-5}$
$=345{,}8\times10^{-5}$
$=3{,}458\times10^{-3}$

1 for / *vir* 340×10^{-5}
1 for / *vir* $3{,}458\times10^{-3}$

(2)

2.4

2.4.1 $8x+3=3x-22$
$8x-3x=-22-3$
$5x=-25$
$x=-5$

1 Simplify / *Vereenvoudig*
$5x=-25$
1 Answer / *Antwoord*
No mark = 5 / *Geen punte = 5*

(2)

2.4.2 $x-\frac{x-1}{2}=3$
$2x-(x-1)=6$
$2x-x+1=6$
$x=5$

1 Multiply entire equation by 2 / *Vermenigvuldiging* met 2
1 for / *vir* $-x+1$
1 Answer / *Antwoord*

(3)

2.4.3 $2^x=16$
$2^x=2^4$
$x=4$

1 for / *vir* 2^4
1 Answer / *Antwoord*

(2)

QUESTION / *VRAAG* 3

3.1 $A = P(1+i)^n$

$A = 150000(1+\frac{9}{100})^5$

$A = R230\ 793{,}59$

OR

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

$A = 150\ 000\ (1+ 0{,}009)^5$

$A = R230\ 793{,}59$

1 Substitution of 150 000/Substitusie van 150 000

1 Substitution $(1+\frac{9}{100})^5$ / *Substitusie* $(1+\frac{9}{100})^5$

1 Answer / *Antwoord*

(3)

3.2 $\frac{R230\ 793{,}59}{60} = R3\ 846{,}56$

CA from 3.1
1 for / *vir* $R230\ 793{,}59$
1 for / *vir* 60 maande / months
1 Answer / *Antwoord*

(3)

3.3 $\frac{R150\ 000 - R120\ 000}{R120\ 000} \times 100\%$

$= \frac{R30\ 000}{R120\ 000} \times 100\%$

$= 25\%$

1 for / *vir* R30 000
1 for / *vir* 100%
1 Answer / *Antwoord*

(3)

QUESTION / *VRAAG* 4

4.1 a - $\frac{300}{4} = 75km/h$

S = $\frac{\text{distance}}{\text{time}}$ 1 Substitution / $S = \frac{Afstand}{Tyd}$ *Substitusie*
1 Answer / *Antwoord*

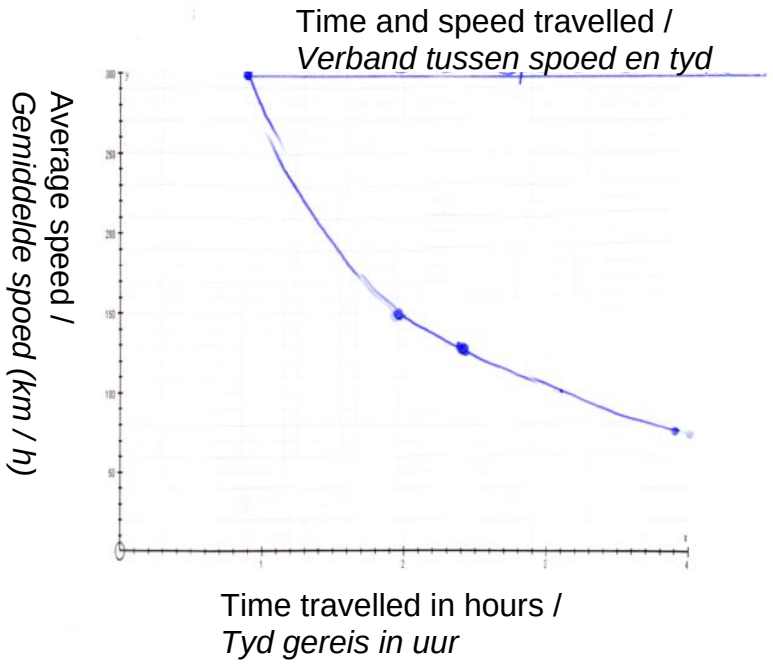
b - $300 \times b = 300$
$b = 1$

T = $\frac{\text{distance}}{\text{speed}}$ 1 Substitution / $T = \frac{afstand}{spoed}$ *Substitusie*
1 Answer / *Antwoord*

c - $\frac{300}{2,5} = 120km/h$

1 Substitution / *Substitusie*
1 Answer / *Antwoord* (6)

4.2



CA from 4.1
1 Benoeming van Asse / *Labelling of Axes*
1 Plot van punte / *Plotting*
1 Connect points / *Verbind punte*
1 Heading / *Opskrif*

(4)

4.3 3 hours / *uur*

CA from 4.2.
2 Answers / *Antwoorde* (2)

QUESTION / *VRAAG* 5

5.1 15 matchsticks / *vuurhoutjies*.

1 Answer / *Antwoord* (1)

5.2 Add 3 with every term that follows. / *Plus 3 by elke volgende term*

1 Explanation / *Verduideliking* (1)

5.3 $T_1 = 3(1) + 3 = 6$
$T_2 = 3(2) + 3 = 9$
$T_3 = 3(3) + 3 = 12$
$\therefore T_n = 3n + 3$

1 for / *vir* $3n$
1 for / *vir* $+3$ (2)

5.4 $T_{20} = 3(20) + 3$
$T_{20} = 60 + 3$
$T_{20} = 63$ matchsticks / *vuurhoutjies*

CA from 5.3.
1 Substitution / *Substitusie*
1 Answer / *Antwoord*
(2)

QUESTION / *VRAAG* 6

6.1 $95° + y = 180°$
$y = 85°$

CO-interior angles (AB // CD) /
KO-binne hoeke (AB // CD)

1 Statement / *Uitdrukking*
1 Answer / *Antwoord*
1 Reason and parallel lines /
Rede en ewewydige lyne

OR

Alternative Mathematical methods (3)

6.2 $x + 14° = 104°$
$x = 90°$

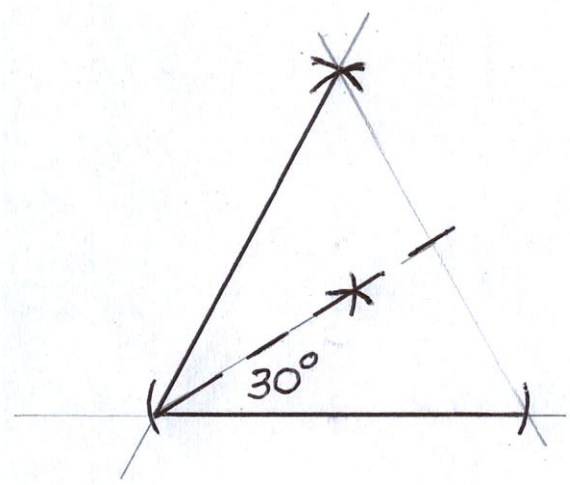
Corresponding angles (AB // CD) /
Ooreenkomstige hoeke (AB // CD)

1 Statement / *Uitdrukking*
1 Answer / *Antwoord*
1 Reason and parallel lines /
Rede en ewewydige lyne

OR

Alternative Mathematical Methods (3)

6.3



1 Construct 60º angle/
Skets van 60º hoek
1 Bisect the 60° angle/
Deel van 60º hoek
1 Measurement of the 30° angle/
Meting van 30º hoek

OR
Alternative Mathematical Methods
(except with a protractor

(3)

QUESTION / *VRAAG* 7

7.1.

In ΔABC and / en ΔEDC:

1. AC = CE Given / *Gegee*
2. BC = CD Given / *Gegee*
3. $\hat{C}_1 = \hat{C}_2$ Vertically opposite angles / *Regoorstaande hoeke*

ΔABC ≡ ΔEDC (S,<,S)

3×1 mark and correct reason/ *3×1 Punt met korrekte rede*

1 Conclusion with reason / *Afleiding met rede*

(4)

7.2. $\hat{C}_1 = 60° = \hat{E}$ Given / *Gegee*

$x = \hat{E} = 60°$ Alternate angles (AB // DE) / *Verwisselende hoeke (AB // DE)*

1 $\hat{C}_1 = 60° = \hat{E}$ PLUS reason / *rede*

1 for / *vir* $x = \hat{E} = 60°$

1 Reason and parallel sides / *Rede en ewewydige sye*

(3)

QUESTION / *VRAAG* 8

8.1 $\frac{KM}{MO} = \frac{KL}{NO} = \frac{LM}{NM}$

$\frac{24}{16} = \frac{12}{x} = \frac{y+16}{20}$

$\frac{24}{16} = \frac{12}{x}$

$192 = 24x$

$x = 8cm$

1 Multiply / *Vermenigvuldig*
$192 = 24x$

1 Answer / *Antwoord*
$x=8$

(2)

8.2 $\frac{24}{16} = \frac{y+16}{20}$

$480 = 16(y + 16)$

$480 = 16y + 256$

$224 = 16y$

$14cm = y$

1 Substitution / *Substitusie*
$\frac{24}{16} = \frac{y+16}{20}$

1 Multiply / *Vermenigvuldig*
$224 = 16y$

1 Answer / *Antwoord*
$x = 14$

(3)

QUESTION / *VRAAG* 9

9.1 Pythagoras $20^2 - 16^2 = (AD)^2$

$400 - 256 = (AD)^2$

$\sqrt{144} = AD$

$12m = AD$

1 Substitution / *Substitusie*
1 Answer / *Antwoord*

(2)

9.2 *Oppv reghoek /Area rectangle* $= l \times b$

= 12 m x 30 m

= 360 m^2

CA from 9.1

1 Answer / *Antwoord* 360 m²
Do not penalise for units

Oppv semi sirkel / Area semi circle $= \frac{\pi r^2}{2}$

$= \frac{3{,}14(6)^2}{2}$

= 56,52 m²

1 Radius
1 Answer / *Antwoord* 56,52m²

360 m² + 56,52 m² = 416,52 m²

1 Answer / *Antwoord* 416,52 m²
Do not penalise for units

(4)

9.3 *Omtrek*/ Perimeter $= \frac{2\pi r}{2} + 30 + 30 + 20 + 16$

$= \frac{2(3{,}14)(6)}{2} + 30 + 30 + 20 + 16$

$= 18{,}84 + 96$

$= 114{,}84$ m

CA from 9.1.
1 Adding / *Optel*
1 for dividing by 2/
Vir deel met 2
1 Simplify / *Vereenvoudig*
1 Answer / *Antwoord*
1 for unit / *vir eenheid* (5)