education

MPUMALANGA PROVINCE
REPUBLIC OF SOUTH AFRICA

NATIONAL
SENIOR CERTIFICATE
NASIONALE
SENIOR SERTIFIKAAT

GRADE / GRAAD 10

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PHYSICAL SCIENCES / FISIESE WETENSKAPPE

MARKING GUIDELINES
NASIENRIGLYNE

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MARKS/PUNTE: 100

These marking guidelines consist of 7 pages.
Hierdie nasienriglyne bestaan uit 7 bladsye.

QUESTION/VRAAG 1

1.1 D ✓✓ (2)

1.2 B ✓✓ (2)

1.3 B ✓✓ (2)

1.4 B ✓✓ (2)

1.5 D ✓✓ (2)

[10]

QUESTION/VRAAG 2

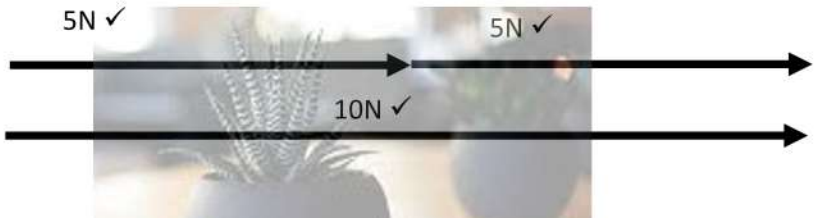
2.1

2.1.1 the single vector having the same effect as two or more vectors together. **(2)**

die enkele vektor wat dieselfde effek het as twee of meer vektore saam ✓✓

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2.1.2 **(3)**



2.1.3 **(3)**



2.2

2.2.1 Motion along a straight line./ Beweging in 'n reguitlyn ✓✓ **(2)**

2.2.2 $\Delta x = CD + DC + CE$

$\Delta x = 34m + 34m + 50m$

$\Delta x = 118\ m$✓

$Averge\ speed = \frac{total\ distance}{total\ time}$✓ / $gemiddelde\ spoed = \frac{totale\ afstand}{totale\ tyd}$

$= \frac{118}{90}$✓

$= 1{,}31\ m \cdot s^{-1}$✓ (4)

[14]

QUESTION/VRAAG 3

3.1 Distance - the total path length travelled✓ and it is a scalar quantity✓ (4)
Afstand - die totale padlengte afgelê en dit is 'n skalaar hoeveelheid.

Displacement - the difference in position in space ✓and it is a vector quantity. ✓
Verplasing - die verandering in posisie in ruimte en dit is 'n vektorhoeveelheid.

3.2 Total distance travelled / Totale afstand afgelê = 12m✓✓ (2)

3.3 displacement is a vector quantity that points from the initial to the final position. ✓✓ (4)
verplasing is 'n vektorhoeveelheid wat van die begin na die finale verandering in posisie wys.

Displacement / verplasing is 5m✓ 53.1^0 ✓

3.4 $speed/spoed = \frac{distance/afstand}{time/tyd}$✓

$speed/spoed = \frac{12}{30}$✓

$speed/spoed = 0.4m \cdot s^{-1}$✓ (3)

3.5 $v = \frac{\Delta x}{t}$✓

$v = \frac{5}{30}$✓

$v = 0.167m \cdot s^{-1}$✓ 53.1^0✓ (4)

3.6

3.6.1 the rate of change of position. ✓ (1)
die tempo van verandering van posisie.

3.6.2 $v = \frac{\Delta x}{\Delta t}$✓

$v = \frac{350}{120}$✓

$v = 2.912m \cdot s^{-1}$ ✓$WEST/WES$✓ (3)

3.6.3 $speed/spoed = \frac{distance/afstand}{time/tyd}$✓

$3.75 = \frac{distance/afstand}{120}$✓

$distance/afstand = 450$✓

$450 = 2XY + 350$ (4)

$XY = 50m$

$\therefore \frac{point}{punt} Y\ is\ 50m \qquad EAST/OOS$✓

[25]

QUESTION/VRAAG 4

4.1

4.1.1 Time/ Tyd(s) ✓ (1)

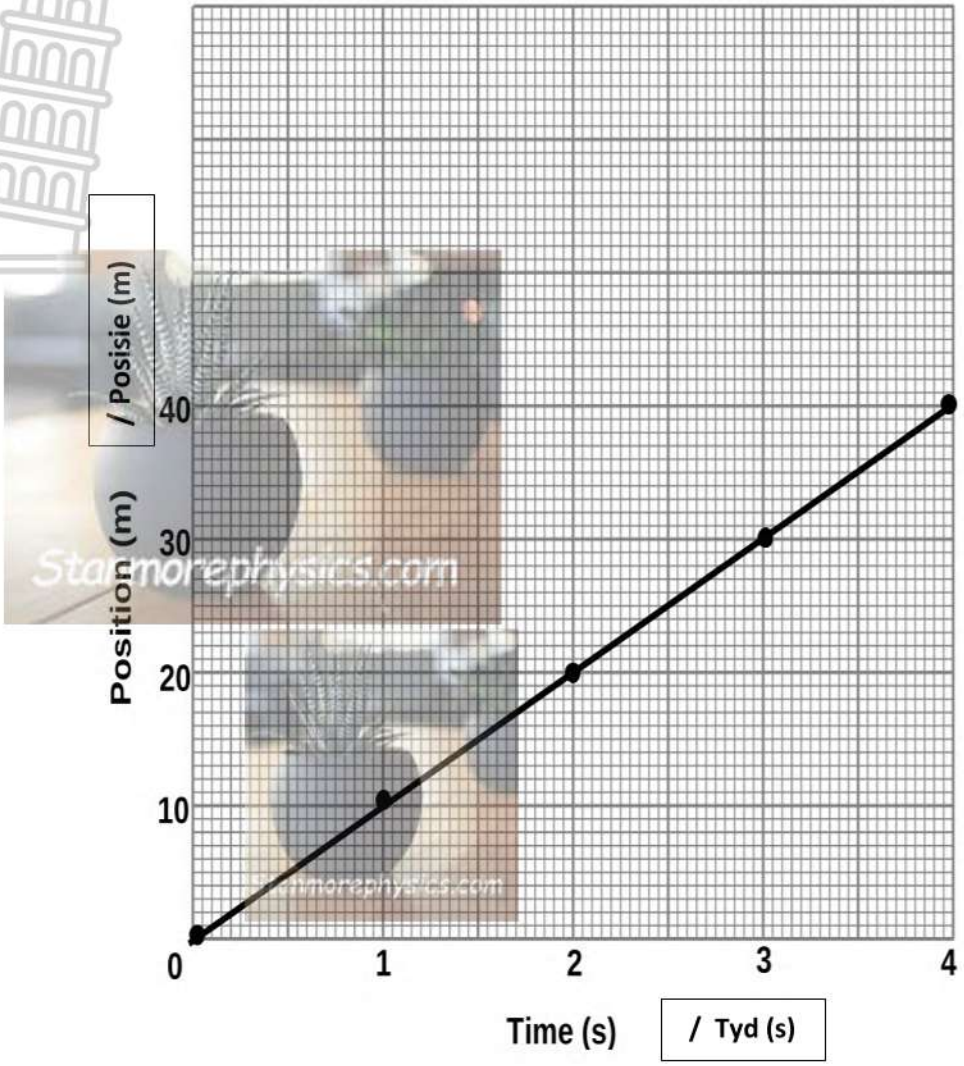
4.1.2 Position/Posisie (m) ✓ (1)

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4.2

The graph of position (m) versus time (s)

Die grafiek van posisie (m) teen tyd (s)



Marking criteria

Title/heading Titel/Opskrif	✓
Correct Axis / Asses korrek	✓
Shape of graph/ Vorm van grafiek	✓✓

(4)

4.3

$gradient/gradiënt = \frac{\Delta x}{\Delta t}$ ✓

$= \frac{40 - 0}{4 - 0}$ ✓

$= 10m \cdot s^{-1}$ ✓

(3)

4.4 Average velocity./ Gemiddelde snelheid ✓ (1)

[10]

QUESTION/VRAAG 5

5.1

5.1.1 the rate of change of velocity./Tempo van verandering van snelheid ✓ (1)

5.1.2

OPTION/ OPSIE1	OPTION/ OPSIE 2
$a = \frac{\Delta v}{\Delta t}$✓ $a = \frac{0x25}{5}$✓ $a = -5m \cdot s^{-2}$ $a = 5m \cdot s^{-2}$ west✓	$v_f = v_i + a\Delta t$✓ $0 = 25 + a(5)$ ✓ $a = -5m \cdot s^{-2}$ $a = 5m \cdot s^{-2}$ west✓

(3)

5.1.3

POSITIVE MARKING FROM POSITIEWE MERK VANAF QUESTION/VRAAG 5.1.2	
OPTION/ OPSIE 1	**OPTION/ OPSIE 2**
VAN/ BAKKIE $\Delta x = \frac{v_f + v_f}{2}\Delta t$✓ $\Delta x = \frac{0+25}{2} \times 5$✓ $\Delta x = 62.5m$	**VAN/ BAKKIE** $\Delta x = v_i\Delta t + \frac{1}{2}a\Delta t^2$✓ $\Delta x = 25 \times 5 + \frac{1}{2}(-5) \times 5^2$✓ $\Delta x = 62.5m$
CAR/ KAR $\Delta x = v_i\Delta t + \frac{1}{2}a\Delta t^2$✓ $\Delta x = 25 \times 5 + \frac{1}{2}0 \times 5^2$✓ $\Delta x = 125m$	**CAR/ KAR** $\Delta x = v_i\Delta t$✓ $\Delta x = 25 \times 5$✓ $\Delta x = 125m$
distance between the vehicles ... afstand tussed die voertuie $= 125 - 62.5 - 5 = 57.5m$✓	

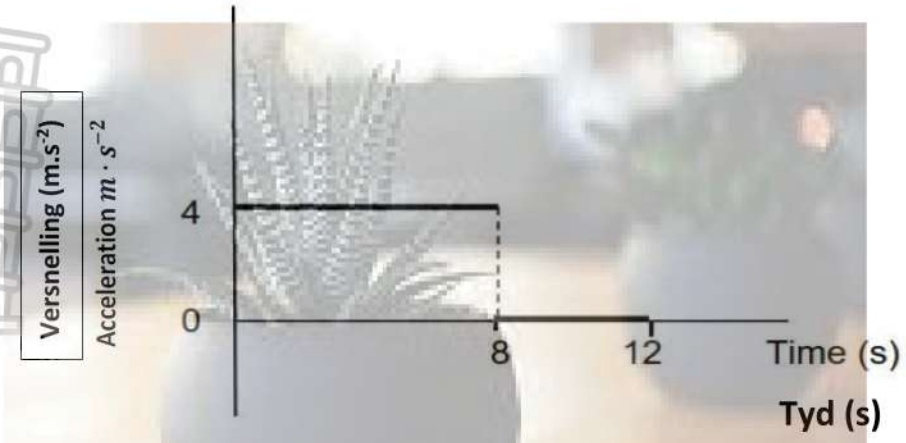
(5)

5.2

5.2.1 The velocity of an object changes with the same amount during each time interval. (2)
Die snelheid van 'n voorwerp verander met dieselfde hoeveelheid gedurende elke tydinterval.✓✓

5.2.2 $a == \frac{\Delta v}{\Delta t}$✓
$4 = \frac{X-0}{8-0}$✓
$X = 32\ m \cdot s^{-1}$✓ (3)

5.2.3



(3)

MARKING CRITERIA/ MERK AANWYSINGS	
Horizontal line at $4m \cdot s^{-2}$ from 0 to 8 seconds Horisontale lyn by 4m.s^{-2} vanaf 0 tot 8 sekondes	✓
Horizontal line at 0 $m \cdot s^{-2}$ from 8 to 12 seconds Horisontale lyn by 0 m.s^{-2} vanaf 8 tot 12 sekondes	✓
Shape (2 parallel horizontal lines that are disjointed Vorm (2 parallelle horisontale lyne wat geskei is.	✓

[17]

QUESTION/VRAAG 6

6.1 Is the number of particles (atoms, molecules, formula-units) present in mole (N_A = 6,023 x 10^{23} mol^{-1}). that is the same amount of atoms as in 12g C12✓✓
Is die aantal deeltjies (atome, molekules, formule-eenhede) teenwoordig in EEN mol (N_A = 6,023 x 10^{23} mol^{-1}), wat dieselfde is as wat daar atome is in 12g C12

(Avogadro's law states that "equal volumes of all gases, at the same temperature and pressure, have the same number of molecules.") (2)

6.2

6.2.1 $$n(SO)_2 = \frac{V}{V_m} ✓$$
$$n(SO)_2 = \frac{2.45}{22.4} ✓$$
$$n(SO)_2 = 0.11mol ✓$$

(3)

6.2.2 **POSITIVE MARKING FROM/ POSITIEWE MERK VANAF 6.2.1**

SO_2 : SO_3
2 : 2✓

(4)

$n(SO)_2 = 0.11mol$

$n(SO)_2 = \frac{m}{M}$ ✓

$0.11 = \frac{m}{64}$ ✓

$m(SO)_2 = 7.04g$ ✓

6.2.3 **POSITIVE MARKING FROM/ POSITIEWE MERK VANAF 6.2.1**

$O_2 : SO_3$

1 : 2 ✓

$n(SO)_2 = 0.055mol$

$n(O)_2 = \frac{N}{N_A}$ ✓

$0.055 = \frac{N}{602 \times 10^{23}}$ ✓

$N(O)_2 = 3.31 \times 10^{22} O_2 molecules \ldots . molekules$ ✓ (4)

6.3

6.3.1 the simplest whole-number ratio of atoms in a compound. ✓✓
/ die eenvoudigste heelgetalverhouding van atome in 'n verbinding (2)

6.3.2 Consider 100g. Gegee 100g

Element	Mass(a)(g) Per 100g	$n = \frac{m}{M}$	Simplest ratio Eenvoudigste verhouding	
Na	29.11	$n = \frac{29.11}{23}$=1.27 ✓	$\frac{1.27}{1.27} = 1 \times 2 = 2$	Obtaining all simplest ratio ✓ Verkry oral die eenvoudigste verhouding
S	40.51	$n = \frac{40.51}{32}$=1.27 ✓	$\frac{1.27}{1.27} = 1 \times 2 = 2$	
O	30.38	$n = \frac{30.38}{16}$=1.9 ✓	$\frac{1.9}{1.27} = 1 \times 3 = 3$	
Empirical formula/ Empiriese formule ✓ $Na_2S_2O_3$				

(5)

6.3.3 $M(CuSO_4 \cdot 5H_2O) = 63.4 + 32 + 16 \times 4 + 5 \times 2 + 5 \times 16$ (4)

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$249.5g \cdot mol^{-1}$✓

$$\%H_2O = \frac{5 \times 18✓}{249.5} \times 100 \quad ✓$$

$$\%H_2O = 36.7\%✓$$

[24]

T O T A L/ T O T A A L: 100

