



education

Department of
Education
FREE STATE PROVINCE

CONTROL TEST / *KONTROLETOETS*

GRADE 10 / *GRAAD 10*

**TECHNICAL SCIENCES
*TEGNIJSE WETENSKAPPE***

MEMORANDUM

MARCH 2018 / *MAART 2018*

MARKS: 100 / *PUNTE: 100*

TIME: 2 HOURS / *TYD: 2 UUR*

**This memorandum consists of FIVE pages.
*Hierdie memorandum bestaan uit VYF bladsye.***

QUESTION 1 / VRAAG 1

- 1.1 D ✓✓
- 1.2 B ✓✓
- 1.3 C ✓✓
- 1.4 A ✓✓
- 1.5 D ✓✓
- 1.6 B ✓✓
- 1.7 A ✓✓
- 1.8 C ✓✓
- 1.9 A ✓✓
- 1.10 C ✓✓

[20]

QUESTION 2 / VRAAG 2

- 2.1.1 A ✓ (1)
- 2.1.2 mm ✓ (1)
- 2.2 $11,5 \times 1000 \checkmark = 11\,500 \text{ (m)} \checkmark$ (2)
- 2.3 $2,5 \times 10^6 \text{ (m}^3\text{)} \checkmark$ (1)
- 2.4 0,0000126 m ✓ (1)

[6]

QUESTION 3 / VRAAG 3

- 3.1.1 A single vector ✓ that has the same effect as two or more vectors together. ✓

Die enkele vektor ✓ wat dieselfde uitwerking het as twee of meer vektore tesame. ✓ (2)

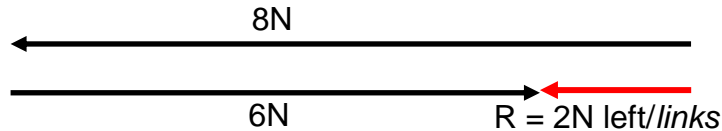
3.1.2 **RIGHT POSITIVE / REGS POSITIEF**

$$R = F_1 + F_2$$

$$= (+20) + (+50) \checkmark$$

$$= +70\text{N} \checkmark \quad (2)$$

3.2.1



Marking criteria / Nasienriglyne	Mark Punt
Correct measurements for the two components. <i>Korrekte afmetings vir die twee komponente.</i>	1
All forces have applicable labels as shown. <i>Alle kragte het geskikte byskrifte soos getoon.</i>	1
Tail-to-head method correctly applied. <i>Stert-by-kopmetode korrek toegepas.</i>	1
Correct final answer for magnitude and direction ($2 \pm 0,1$ N) <i>Korrekte finale antwoord vir grootte en rigting ($2 \pm 0,1$ N).</i>	1

(4)

3.2.2



Use marking criteria of Q3.2.1. Answer must be $14 \pm 0,1$ N.
Gebruik nasienriglyne van V3.2.1. Antwoord moet $14 \pm 0,1$ N wees.

(4)

[12]

QUESTION 4 / VRAAG 4

4.1.1 $w = mg \checkmark = 8 \times 9,8 \checkmark = 78,4 \text{ N} \checkmark$ (3)

4.1.2 $W = F\Delta x \checkmark = 78,4 \times 50 \checkmark = 3\,920 \text{ J} \checkmark$ (3)

4.1.3 $w = mg = 80 \times 9,8 \checkmark = 784 \text{ N}$

$W = F\Delta x = 784 \times 50 \checkmark = 39\,200 \text{ J}$

$W_{\text{total/totaal}} = 3\,920 + 39\,200 = 43\,120 \text{ J} \checkmark$

OR/OF

$w = mg = 88 \times 9,8 \checkmark = 862,4 \text{ N}$

$W = F\Delta x = 862,4 \times 50 \checkmark = 43\,120 \text{ J} \checkmark$ (3)

4.1.4 $P = \frac{W}{\Delta t} \checkmark$

$= \frac{43120 \checkmark}{600 \checkmark}$

$= 71,87 \text{ W} \checkmark$ (4)

4.2.1 Area = πr^2 ✓

$$= \pi \times (2,5)^2 \checkmark$$

$$= 19,63 \text{ m}^2 \checkmark$$

(3)

4.2.2. Area = $\ell \times b$ ✓

$$= 12 \times 10 \checkmark$$

$$= 120 \text{ m}^2$$

$$\text{Area of paving} = 120 - 19,63 \checkmark$$

$$= 100,37 \text{ m}^2 \checkmark$$

(4)

4.2.3 Number of bricks = $100,37 \times 50$ ✓ = 5 019 ✓

(2)

4.3.1 $T_1 = \frac{9T_2}{5} + 32$ ✓

$$= \frac{9 \times 24}{5} + 32 \checkmark$$

$$= 75,2^\circ\text{F} \checkmark$$

(3)

4.3.2 $32(^\circ\text{F})$ ✓



(1)

[26]

QUESTION 5 / VRAAG 5

- 5.1.1 Cation: positive ion ✓ Kation: positiewe ioon ✓
Anion: negative ion ✓ Anioon: negatiewe ioon ✓ (2)
- 5.1.2 Mg^{2+} or/of NH_4^+ or/of Na^+ ✓ (1)
- 5.1.3 SO_4^{2-} ✓ (1)
- 5.1.4 CO_3^{2-} ✓ (1)
- 5.1.5 NaOH ✓ (2)
- 5.1.6 MgCO_3 ✓ (2)
- 5.2 CuSO_4 ✓ (2)
- 5.3.1 $2\text{H}_2 + \text{O}_2 \rightarrow 2\text{H}_2\text{O}$ ✓ (2)
- 5.3.2 $2\text{SO}_2 + \text{O}_2 \rightarrow 2\text{SO}_3$ ✓ (2)
- 5.3.3 $\text{Na}_2\text{CO}_3 + 2\text{HCl} \rightarrow 2\text{NaCl} + \text{H}_2\text{O} + \text{CO}_2$ ✓ (2)
- 5.3.4 $2\text{C}_2\text{H}_{10} + 9\text{O}_2 \rightarrow 4\text{CO}_2 + 10\text{H}_2\text{O}$ ✓ (4)
- [21]**

QUESTION 6 / VRAAG 6

- 6.1.1 Water(✓✓) (2)
- 6.1.2 Ethene / Eteen (✓✓) (2)
- 6.1.3 Iron / Yster (✓✓) (2)
- 6.2 Low ✓ density ✓ Lae ✓ digtheid ✓ (2)
- 6.3 Copper / Koper ✓
-  Good electrical conductivity / Goeie elektriese geleidingsvermoë. ✓ (2)
- 6.4 Float/Dryf ✓
-  Density ✓ of aluminium is less than density of mercury. ✓
Digtheid ✓ van aluminium is minder as digtheid van kwik. ✓ (3)
- 6.5 In the ship, the same mass of iron ✓ has a larger volume; density decreases ✓ to float on water. In die skip het dies. massa yster ✓ 'n groter volume; digtheid verminder ✓ om op water te kan dryf. (2)

[15]

GRAND TOTAL/GROOTTOTAAL: 100