



education

Department of
Education
FREE STATE PROVINCE

**PROVINCIAL CONTROL TEST
*PROVINSIALE KONTROLETOETS***

GRADE/GRAAD 10

**TECHNICAL SCIENCES
*TEGNIJSE WETENSKAPPE***

MEMORANDUM

MARCH/MAART 2017

TIME/TYD: 2 HOURS/URE

MARKS/PUNTE: 100

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

QUESTION 1 / VRAAG 1

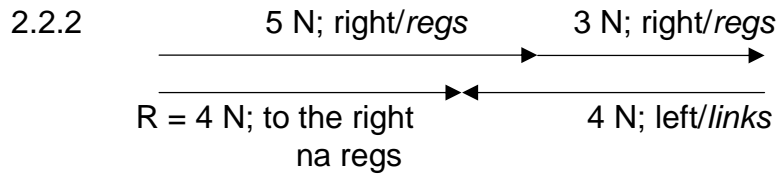
- 1.1 D ✓✓
1.2 B ✓✓
1.3 C ✓✓
1.4 B ✓✓
1.5 C ✓✓
1.6 B ✓✓
1.7 D ✓✓
1.8 C ✓✓
1.9 A ✓✓
1.10 A ✓✓

[20]

QUESTION 2 / VRAAG 2

- 2.1.1 g ✓ (1)
2.1.2 m.s⁻¹ ✓ (1)
2.1.3 Speed / *Spoed* ✓ (1)
2.1.4 1 000 g ⇒ 1 kg
m in kg = $\frac{1350}{1000}$ ✓
= 1,35 kg ✓ (2)
2.1.5 Speed / *Spoed* in km.h⁻¹ = $\frac{125}{1000}$ ✓ x 60 x 60 ✓
= 450 km.h⁻¹ ✓
= $\frac{4,50 \times 10^2}{\checkmark}$ km.h⁻¹ (4)
2.2.1 Vector: A physical quantity with magnitude and direction.
Vektor: 'n Fisiese hoeveelheid met grootte en rigting. ✓
Scalar: A physical quantity with magnitude only.
Skalaar: 'n Fisiese hoeveelheid met grootte alleen. ✓ (2)

- 2.2.2 A single vector (✓) with the same effect as all the other vectors together. ✓
'n Enkele vektor (✓) wat dieselfde uitwerking het as al die ander vektore saam. ✓ (2)



Marking criteria / Nasienriglyne	Mark Punt
Correct measurements of the (magnitudes of the) three components; arrows must be shown. <i>Korrekte afmetings van die (grootte van die) drie komponente; pyle moet getoon word.</i>	1
All components have the correct labels (magnitude and direction). <i>Al die komponente het korrekte byskrifte (grootte en rigting).</i>	1
Tail-to-head method correctly applied to obtain the resultant (all four arrows must be in the correct sequence). <i>Stert-by-kopmetode korrek toegepas om die resultant te verkry (al vier pyle moet in die korrekte volgorde wees).</i>	1
Correct final answer, with correct label (magnitude and direction). <i>Korrekte finale antwoord, met korrekte byskrif (grootte en rigting) .</i>	1

(4)

- 2.2.4 Decrease / Afneem ✓ (1)

- 2.2.5 Let F be the 4th force: Laat F die 4e krag wees:
For F = 4 N: R = 0 ✓ Vir F = 4 N: R = 0 ✓
For F > 4 N; R increases For F > 4 N; R neem toe
to the left. ✓ na links ✓
For F < 4 N up to zero: For F < 4 N up to zero:
R increases to the right. ✓ R neem toe na regs. ✓ (3)
[21]

QUESTION 3 / VRAAG 3

3.1 Volume = $\pi r^2 h$ ✓
 $16 \checkmark = \pi (1,5^2) h \checkmark$
 $h = 2,26 \text{ m} \checkmark$ (4)

3.2 Volume = $0,85 \times 16\,000 \checkmark$
 $= 13\,600 \text{ l} \checkmark$ (2)

3.3 Rate / Tempo = $\frac{\text{Vol}}{t} \checkmark$
 $= \frac{13\,600}{38 \times 60} \checkmark$
 $= 5,95 \text{ l} \cdot \text{min}^{-1} \checkmark$ (3)

3.4 Area = $\ell \times w \checkmark$ Opp = $\ell \times b$
 $= 4,5 \times 5,5 \checkmark$
 $= 24,75 \text{ m}^2$
 Area = $\pi r^2 \checkmark$ Opp = πr^2
 $= \pi (1,5^2) \checkmark$
 $= 7,07 \text{ m}^2$
 Area to be paved = $24,75 - 7,07 = 17,68 \text{ m}^2$
Oppervlak om te plavei (6)

3.5 Area = $\ell \times w$ Opp = $\ell \times b$
 $= 0,1 \checkmark \times 0,2 \checkmark$
 $= 0,02 \text{ m}^2$
 Number/Aantal = $17,68 / 0,02 \checkmark = 884 \checkmark$ (4)

3.6 Cost/Koste = $884 \times 2,50 \checkmark = \text{R}2\,210 \checkmark$ (2)

3.7 Perimeter = $2\ell + 2w \checkmark$ Omtrek = $2\ell + 2b$
 $= 2(5,5) + 2(4,5) \checkmark$
 $= 20 \text{ m} \checkmark$ (3)

3.8.1 $T_{\circ\text{F}} = \frac{9T_{\circ\text{C}}}{5} + 32 \checkmark$
 $= \frac{9 \times 24}{5} + 32 \checkmark$
 $= 75,2 \text{ }^{\circ}\text{F} \checkmark$ (3)

3.8.1 $32 \checkmark ({}^{\circ}\text{F})$ (1)
[28]

QUESTION 4 / VRAAG 4

- 4.1.1 Plastic or glass ✓ Plastiek of glas ✓ (1)
- 4.1.2 Iron or nickel ✓ Yster of nikkel ✓ (1)
- 4.1.3 Iron or nickel ✓ Yster of nikkel ✓ (1)
- 4.1.4 Graphite ✓ Grafiet ✓ (1)
- 4.1.5 Aluminium ✓ Aluminium ✓ (1)
- 4.2.1 Compounds consists of two or more elements ✓ and
can be broken down in its elements. ✓ (2)
- Verbindings bestaan uit twee of meer elemente ✓ en
kan opgebreek word in elemente. ✓*
- 4.2.2 1: Compound/Verbinding ✓ (1)
- 2: Element ✓ (1)
- 3: Element ✓ (1)
- [10]**

QUESTION 6 / VRAAG 6

Accept answers if the symbols are given instead of the letters.

Aanvaar antwoorde indien die simbole in plaas van die letters gegee is.

- 5.1.1 E or/of H ✓ B or/of Zn (1)
- 5.1.2 B or/of D or/of I ✓ O or/of He or/of S (1)
- 5.1.3 E ✓ B (1)
- 5.1.4 D ✓ He (1)
- 5.1.5 G ✓ Pb(SO₃)₂ (1)
- 5.1.6 C ✓ Na⁺ (1)
- 5.2 Na₂SO₄ ✓ (1)
- 5.3 Lead(IV)✓ sulphite ✓ / Lood(IV)✓ sulfiet ✓ (2)
- 5.4 Sulphur✓ trioxide✓ / swawel✓ trioksied✓ of/or
Sulphur(VI)✓ oxide✓ / swawel(VI)✓ oksied✓ (2)
- 5.5 Sulphate / Sulfaat ✓ (1)
- [12]**

QUESTION 6 / VRAAG 6

- 6.1 Ba(OH)₂ + 2HNO₃ ✓ → Ba(NO₃)₂ + 2H₂O ✓ (2)
- 6.2 Mg + Br₂ → MgBr₂ ✓ (1)
- 6.3 2Li ✓ + 2HCl ✓ → 2LiCl + H₂ ✓ (3)
- 6.4 4Al ✓ + 3O₂ ✓ → 2Al₂O₃ ✓ (3)

[9]

GRAND TOTAL/GROOTTOTAAL: 100