



# education

Department of  
Education  
FREE STATE PROVINCE

**EXPERIMENT / *EKSPERIMENT***

**GRADE 10 / *GRAAD 10***

**TECHNICAL SCIENCES  
*TEGNIJSE WETENSKAPPE***

**SEPTEMBER 2018**

**MEMORANDUM**

**MARKS: 30 / *PUNTE:30***

This memorandum consists of **THREE** pages.  
Hierdie memorandum bestaan uit **DRIE** bladsye.

### QUESTION 1 / VRAAG 1

1.1 Spring balance ✓ / *trekskaal* (1)

1.2 newton ✓ (1)

1.3 8 (N) ✓ (1)

✓ 1.4 Resultant / net force ✓✓ / *Resultant / netto krag* (2)

✓ 1.5  (3)

1.6 8 (N) ✓ (1)

1.7 Equal in magnitude ✓ / *Gelyk in grootte*  
Opposite directions ✓ / *teenoorgestelde rigtings* (2)

1.8 Equilibrant ✓ / *ekwilibrant* (1)

1.9 The resultant and equilibrant ✓ have the same magnitude ✓ but act in opposite directions ✓ / *Die resultant en ekwilibrant het dieselfde grootte maar werk in teenoorgestelde rigtings* (3)

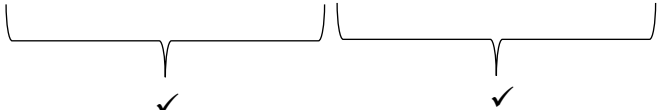
[15]

### QUESTION 2 / VRAAG 2

2.1.1 A: Meter stick/ ruler ✓ / *meterstok / liniaal* (1)

2.1.2 

First step / <i>Eerste stap</i>	4	1	2	3	Last step / <i>Laste stap</i>
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 (2)

2.1.3 

Clockwise moment = Anti-clockwise moment /  
*Kloksgewysse momente = Anti-kloksgewys momente*  
Force x distance = force x distance /  
*Krag x afstand = krag x afstand*  
 $3 \times 40 = F \times 30$  ✓  
 $F = 4 \text{ N}$  ✓

 (2)

2.1.4 Smaller than (40 cm) ✓ / *kleiner as 40 cm* (1)

- 2.1.5 Controlled variable: (clockwise/anti-clockwise) moment ✓ /  
Gekontroleerde veranderlike: (kloksgewys / antikloksgewys) momente (1)
- Dependant variable: distance ✓ / Afhanklike veranderlike: afstand (1)
- Independent variable: force ✓ / Onafhanklike veranderlike: krag (1)
- 2.1.6 Clockwise moment equal to anti-clockwise moment ✓✓ /  
Kloksgewyse momente gelyk aan antikloksgewyse momente (2)
- 2.2 Traffic cone ✓  
The traffic cone has no fulcrum/ the traffic cone has no pivotal point/the traffic cone doesn't rotate about a point ✓(any one)  
Verkeerskegel  
Die verkeerskegel het geen draaipunt nie / die verkeerskegel draai nie om 'n punt nie (2)
- 2.3.1 Force ✓ / krag (1)
- 2.3.2 Lever ✓ / hefboom (1)
- [15]**

**GRAND TOTAL / GROOTTOTAAL: 30**