

**GAUTENG DEPARTMENT OF EDUCATION
GAUTENGSE DEPARTEMENT VAN ONDERWYS
SENIOR CERTIFICATE EXAMINATION
SENIORSERTIFIKAAT-EKSAMEN**

**WELDING AND METALWORKING SG
SWEIS- EN METAALBEWERKING**

QUESTION / VRAAG 1

1.1	1.1.1	TRUE	WAAR
	1.1.2	TRUE	WAAR
	1.1.3	TRUE	WAAR
	1.1.4	TRUE	WAAR
	1.1.5	FALSE	ONWAAR
	1.1.6	FALSE	ONWAAR
	1.1.7	FALSE	ONWAAR
	1.1.8	FALSE	ONWAAR
	1.1.9	TRUE	WAAR
	1.1.10	FALSE	ONWAAR
	1.1.11	FALSE	ONWAAR
	1.1.12	TRUE	WAAR
	1.1.13	FALSE	ONWAAR
	1.1.14	FALSE	ONWAAR
	1.1.15	TRUE	WAAR

(15)

- 1.2 1.2.1 I
- 1.2.2 J
- 1.2.3 T
- 1.2.4 O
- 1.2.5 Q
- 1.2.6 A
- 1.2.7 C
- 1.2.8 D
- 1.2.9 B
- 1.2.10 E
- 1.2.11 S
- 1.2.12 R
- 1.2.13 K
- 1.2.14 M
- 1.2.15 G
- 1.2.16 F
- 1.2.17 H
- 1.2.18 N
- 1.2.19 L
- 1.2.20 P

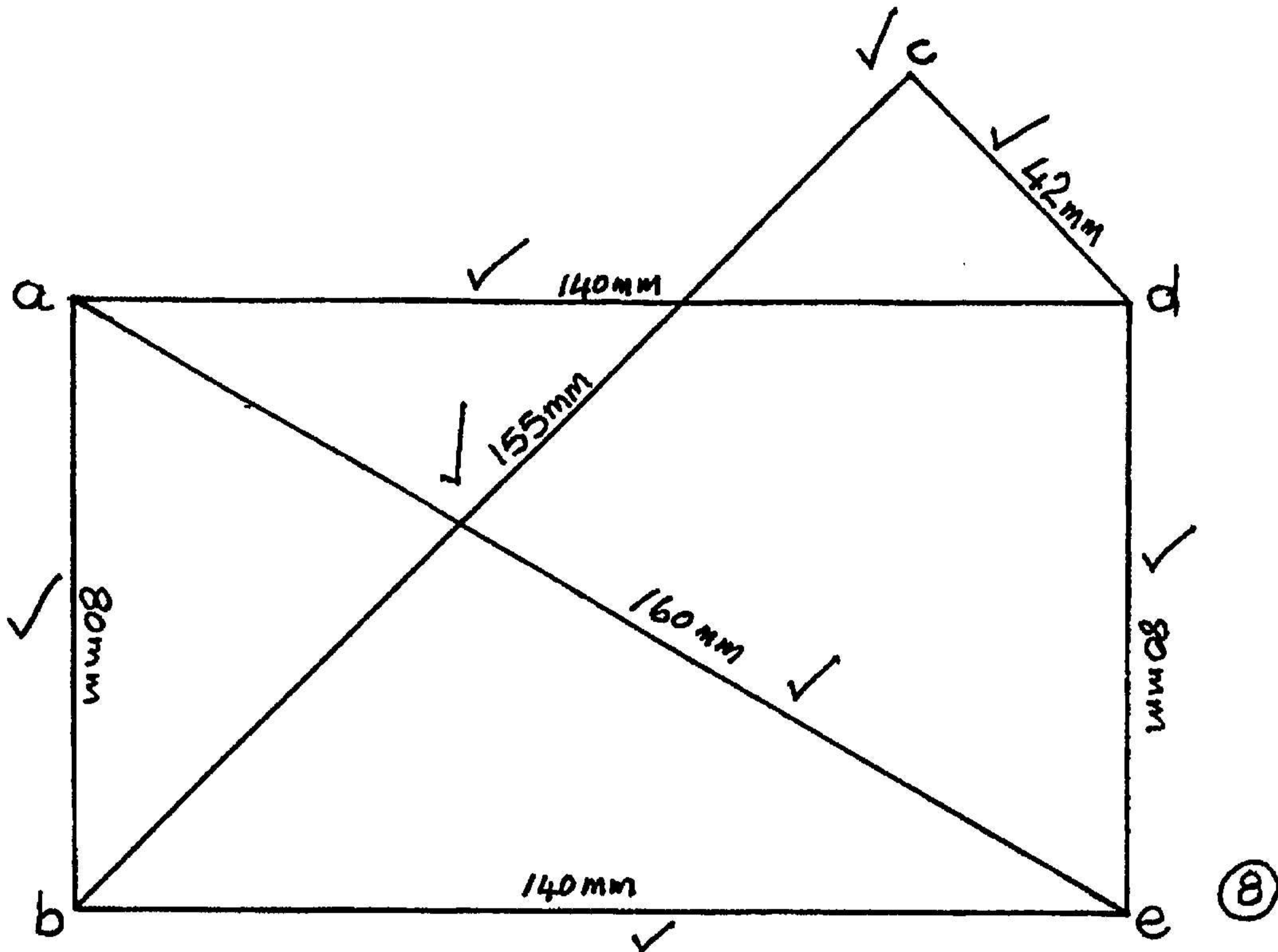
(20)

- 1.3 1.3.1 C
- 1.3.2 B
- 1.3.3 C
- 1.3.4 B
- 1.3.5 D

(5)
[40]

QUESTION / VRAAG 2.1

2.1.1

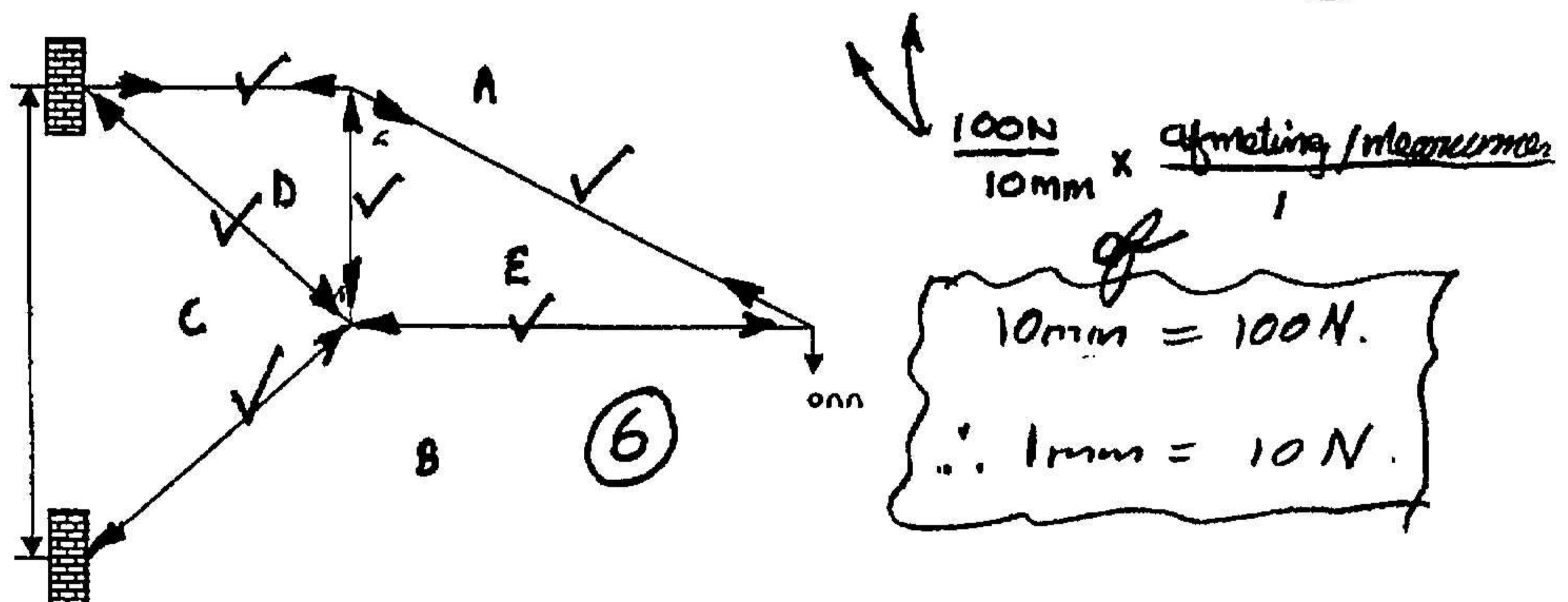


2.1.2

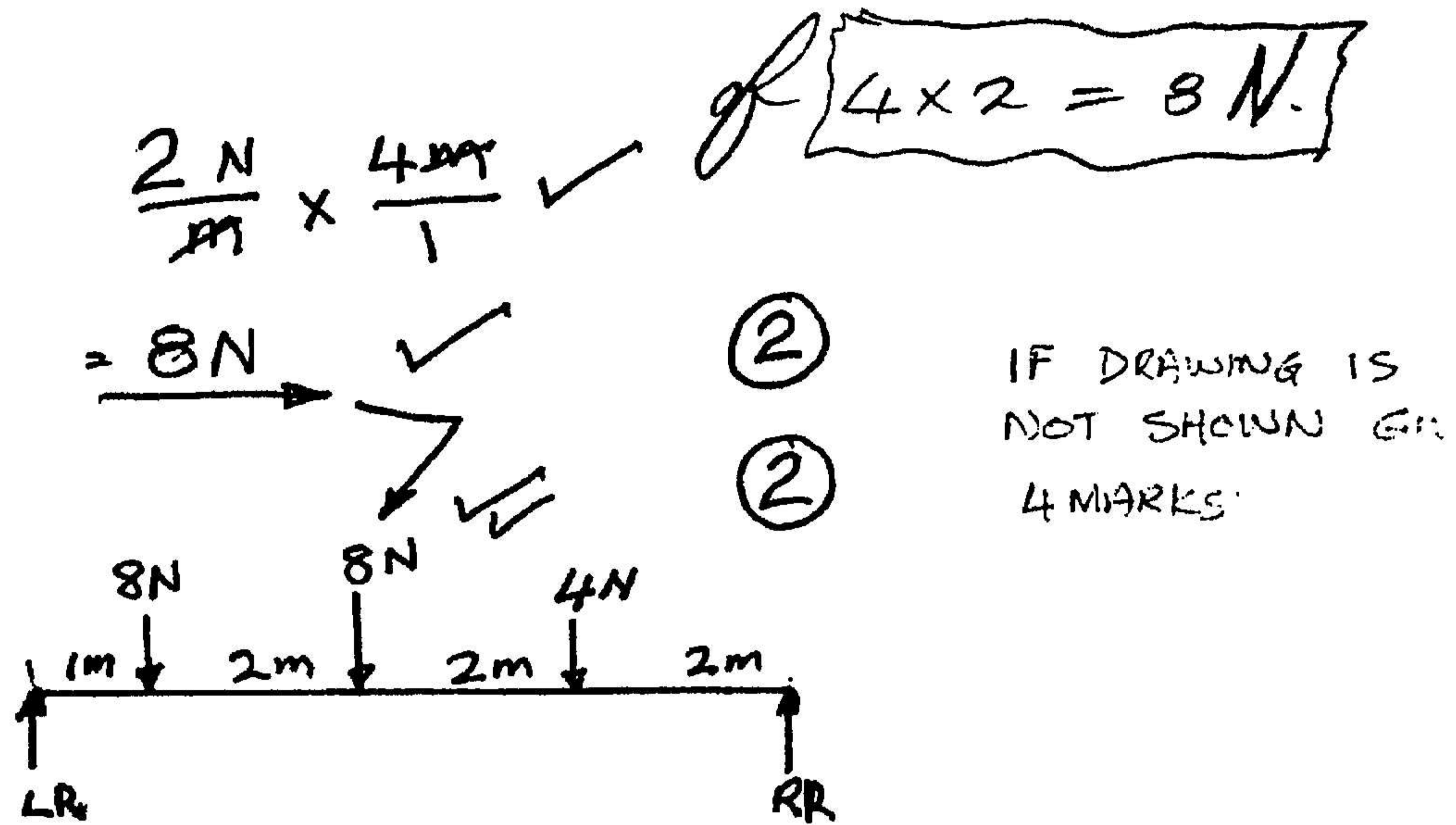
MEMBER. ONDERDEEL	MEASUREMENT AFMETING	TIEBEAM SPANBALK	STRUT STUTBALK
BC	155 mm ✓		1550 N ✓
CD	42 mm ✓		420 N ✓
DE	80 mm ✓		800 N ✓
EB	140 mm ✓		1400 N ✓
AD	140 mm ✓	1400 mm ✓	
AE	160 mm ✓	1600 mm ✓	

(12)

2.1.3



2.2.1



2.2.2

$$(R \times 7\text{m}) = (8\text{N} \times 1\text{m}) + (8\text{N} \times 3\text{m}) + (4\text{N} \times 5\text{m})$$

$$7R\text{m} = 52\text{ Nm}$$

$$R = \frac{52\text{ Nm}}{7\text{m}}$$

$$R = 7.4\text{ N} \checkmark \checkmark$$

⑥

$$(L \times 7\text{m}) = (4\text{N} \times 2\text{m}) + (8\text{N} \times 4\text{m}) + (8\text{N} \times 6\text{m})$$

$$L \times 7\text{m} = 88\text{ Nm}$$

$$L = 12.6\text{ N} \checkmark \checkmark$$

⑥

TEST/TOETS $\uparrow = \downarrow$

$$7.4\text{ N} + 12.6\text{ N} = 8\text{ N} + 8\text{ N} + 4\text{ N}$$

$$20\text{ N} = 20\text{ N}$$

QUESTION / VRAAG 3

3.1.2

$$Bm(a) = (-2N \times 0m) = \underline{0Nm}$$

$$Bm(c) = (-2N \times 3m) = \underline{-6Nm}$$

$$Bm(b) = (-2N \times 8m) + (-2N \times 5m) = \underline{-26Nm}$$

$$Bm(d) = (-2N \times 10m) + (-2N \times 7m) + (-3N \times 2m) \\ = \underline{-40Nm}$$

⑧

3.1.3

$$Sf(a) = 2N + 2N + 3N = \underline{+7N}$$

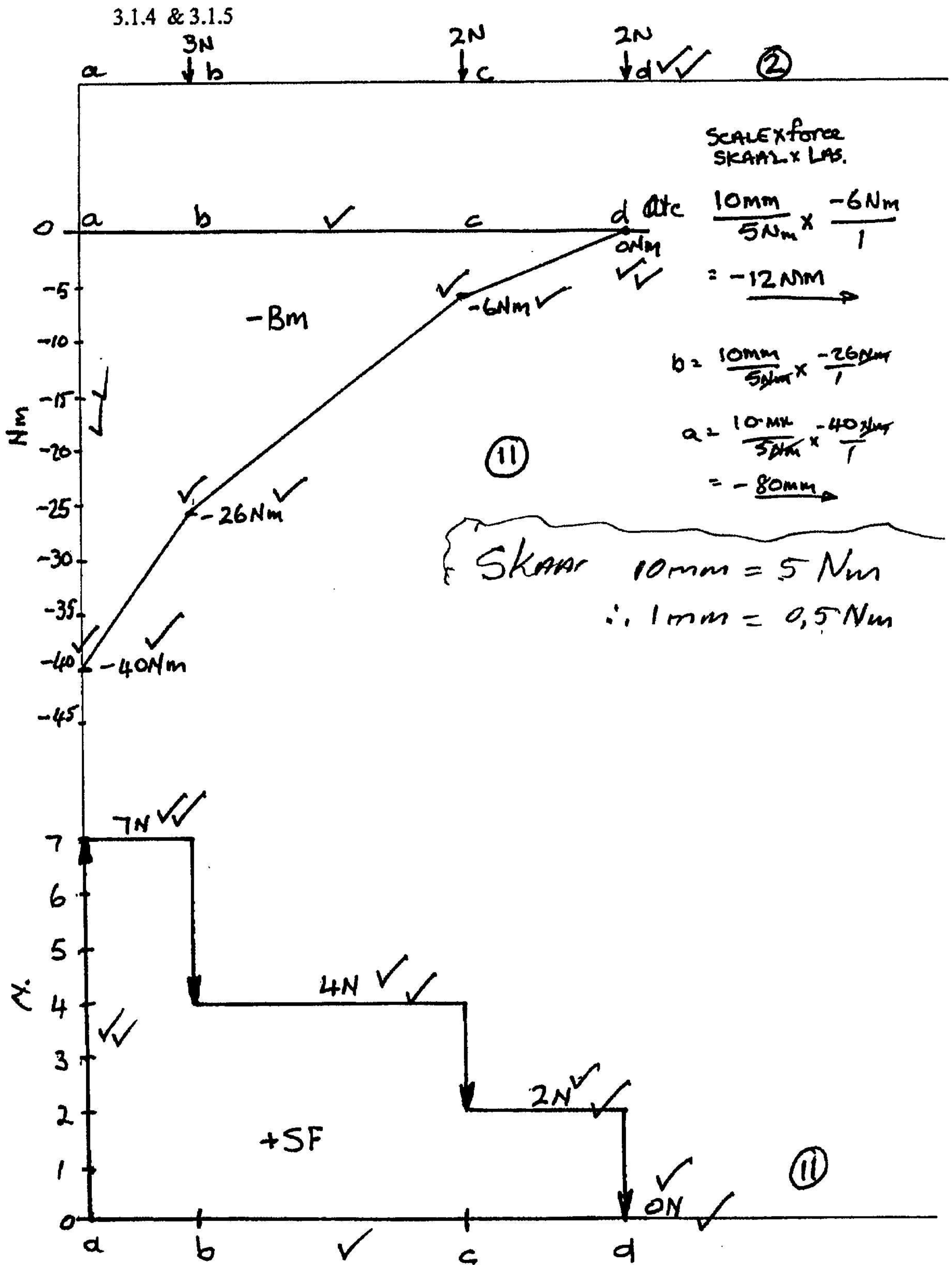
$$Sf(b) = 7N - 3N = \underline{+4N}$$

$$Sf(c) = 7N - 3N - 2N = \underline{+2N}$$

$$Sf(d) = 7N - 3N - 2N - 2N = \underline{0N}$$

⑧

3.1.4 & 3.1.5



QUESTION / VRAAG 4

4.1

FOR xx' / VIR xx'

$$\frac{DC - \phi}{2} = \frac{(1500 - 900)}{2} = \underline{300 \text{ mm}} \quad (4)$$

$$\therefore xx'^2 = xx^2 + h^2 \quad \checkmark$$

$$xx' = \sqrt{300^2 + 1200^2}$$

$$xx' = \underline{1236,9 \text{ mm}} \quad (5)$$

4.2

FOR TL BE' / VIR WL BE'

$$(BE')^2 = EE'(h) + KE^2 + KB^2$$

$$E'B^2 = 1200^2 + 300^2 + 750^2$$

$$E'B = \sqrt{2092500}$$

$$E'B = \underline{1446,5 \text{ mm}} \quad (10)$$

OR / OF

$$EB^2 = KE^2 + KB^2 \quad \checkmark$$

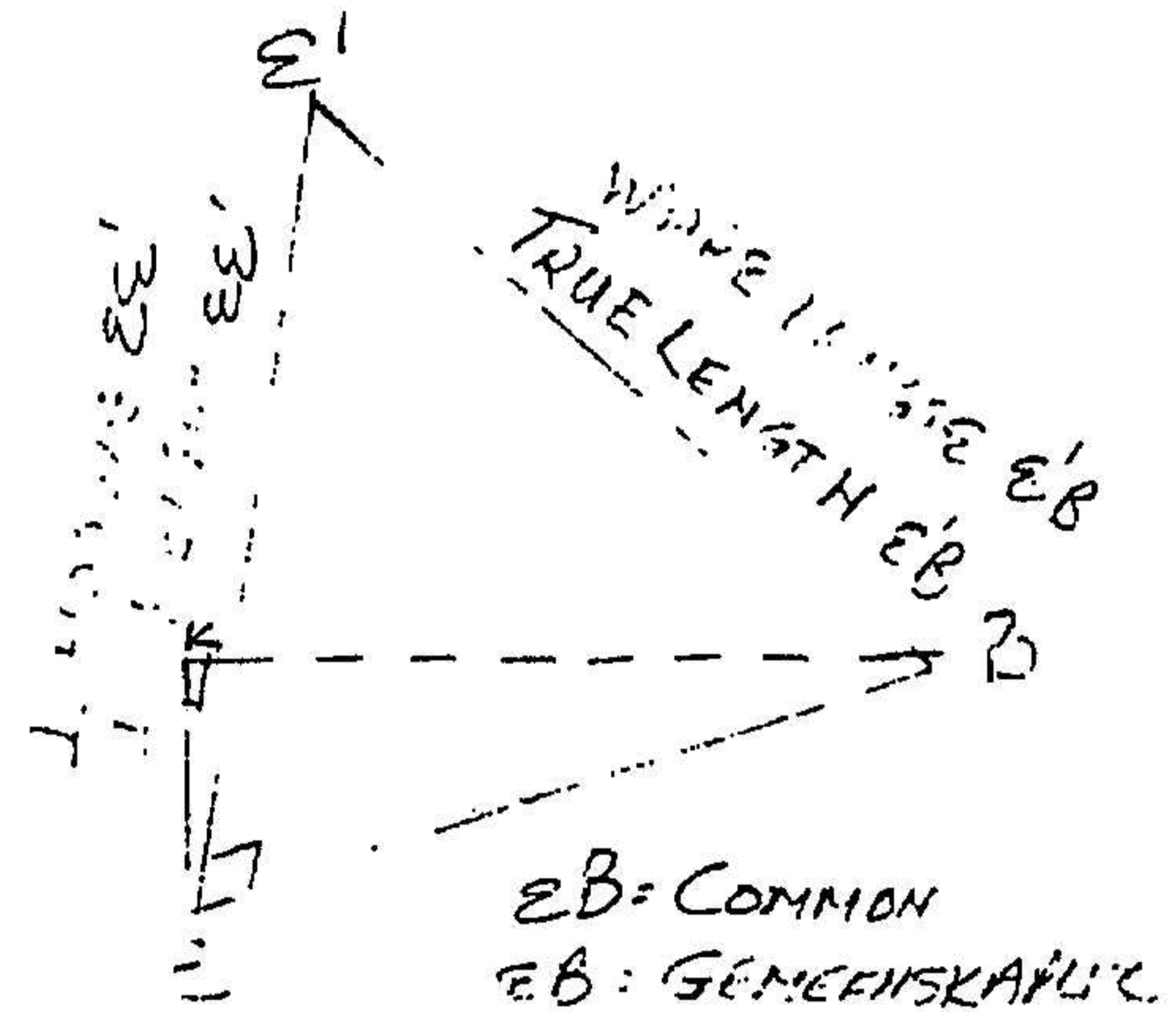
$$EB = \sqrt{750^2 + 300^2}$$

$$EB = \underline{807,77 \text{ mm}} \quad (5)$$

$$E'B^2 = EE'^2 + EB^2 \quad \checkmark$$

$$E'B = \sqrt{1200^2 + 807,77^2}$$

$$E'B = \underline{1446,5 \text{ mm}} \quad (5)$$



$$1) \text{ IN } \Delta KEB \quad EB^2 = KE^2 + KB^2 \quad (5)$$

$$2) \text{ IN } \Delta EEB \quad E'B^2 = EE'^2 + EB^2 \quad (5)$$

$$3) \text{ VERVANG / SUBSTITUTE } EB^2 \\ \hat{=} E'B^2 (WYTL) = EE'^2 + EB^2 + EB^2$$

QUESTION / VRAAG 5.1

5.1.1

$$\frac{30 \text{ mm}}{1000} \checkmark = 0,03 \text{ m} \checkmark$$

②

5.1.2

$$A = \frac{\pi D^2}{4} \checkmark$$

$$A = \frac{\pi (0,03)^2}{4} \checkmark$$

$$A = 706,85 \times 10^{-6} \text{ m}^2 \checkmark$$

of

$$\text{Span} = \frac{\text{Belasting}}{2 \rho g h}$$

$$= \frac{120 \times 10^3 \text{ N}}{\frac{55 D^2}{4 \times 10^6} \text{ m}^2}$$

$$= \frac{120000 \times 4 \times 10^6}{55 (30)^2}$$

$$= 169,7 \times 10^6 \text{ Pa}$$

④

5.1.3

$$\delta = \frac{F}{A} \checkmark$$

$$\delta = \frac{120 \times 10^3 \text{ N}}{706,85 \times 10^{-6} \text{ m}^2} \checkmark$$

$$\delta = 169,76 \times 10^6 \text{ Pa}$$

$$\delta = 169,76 \text{ MPa} \checkmark \checkmark$$

⑥

5.1.4

$$s = \Delta L = \Delta L \checkmark$$

$$s = \frac{312 - 300 \text{ mm}}{300 \text{ mm}} \checkmark \checkmark \checkmark$$

$$s = 40 \times 10^{-3} \checkmark$$

$$\text{of } \frac{12 \text{ mm}}{300 \text{ mm}}$$

⑤

5.1.5

$$E = \frac{\delta}{s} \checkmark$$

$$E = \frac{169,76 \times 10^6 \text{ Pa}}{40 \times 10^{-3} \checkmark}$$

$$E = 4,24 \text{ GPa} \checkmark \checkmark$$

⑤

QUESTION / VRAAG 5.2

5.2.1

Bedrag vir 50kg STAAL / AMOUNT FOR 50kg STEEL.

$$= \text{MASS} \times \text{MASS TARIFF / kg}$$

$$\text{MASSA} \times \text{TARIEF / kg}$$

$$= \frac{50 \text{ kg}}{1} \times \frac{R 8,00}{\text{kg}}$$

$$= \underline{R 400,00} \checkmark$$

③

AMOUNT FOR 72m ANGLE IRON / BEDRAG VIR 72 HOEKYSTER.

$$= \text{LENGTH} \times \text{MASS / m} \times \text{RAND / kg}$$

$$= \frac{72 \text{ m}}{1} \times \frac{10 \text{ kg}}{\text{m}} \times \frac{R 2,50}{\text{kg}}$$

$$= \underline{R 1800,00} \checkmark$$

④

TOTAL MATERIAL COST / TOTALE MATERIAAL KOSTE.

$$= R 400 + R 1800$$

$$= \underline{R 2200,00} \checkmark$$

①

5.2.2

LABOUR COST / ARBEIDSKOSTE

$$= \text{HOURS WORKED} \times \text{TARIFF / HOUR}$$

$$\text{URE GEWENK} \times \text{TARIEF / UUR}$$

$$= \frac{40 \text{ hours}}{1} \times \frac{R 30,00}{\text{hour}}$$

$$= \underline{R 1200,00} \checkmark$$

③

5.2.3

OVERHEAD COST / OORAKOSTE

$$110\% \times \text{LABOUR COST / ARBEIDSKOSTE}$$

$$= \frac{110}{100} \times \frac{R 1200}{1}$$

$$= \underline{R 1320} \checkmark$$

③

5.2.4

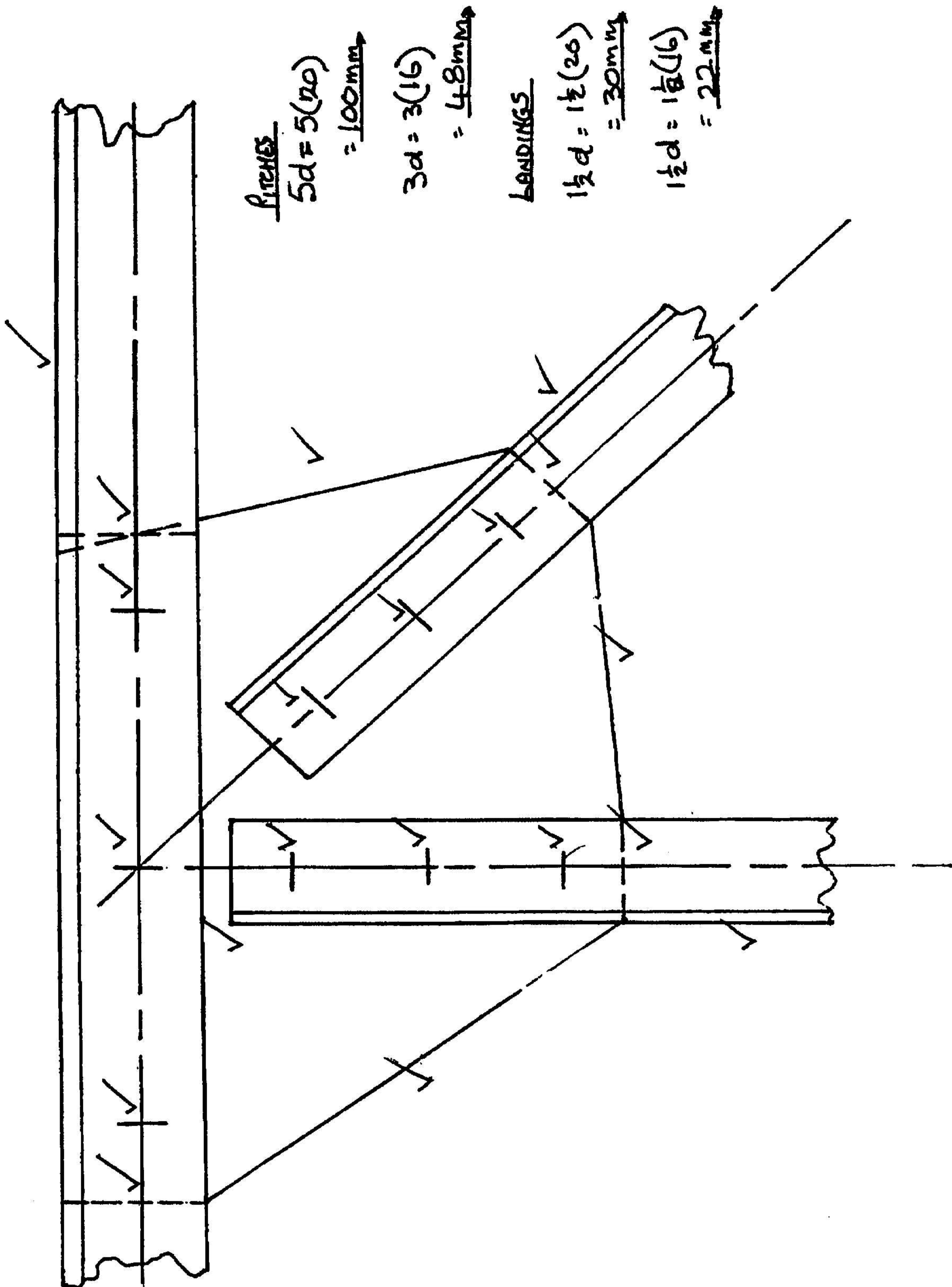
TOTAL COST / TOTALE KOSTE

$$= R 2200 + R 1200 + R 1320$$

$$= \underline{R 4620} \checkmark$$

④

QUESTION / VRAAG 6



QUESTION / VRAAG 6.2

6.2	Saves time saves money avoid repetitive marking off eliminates wastage of material	<i>Bespaar tyd</i> <i>Bespaar geld</i> <i>Vermyn repeterende afmerk</i> <i>Elimineer die vermorsing van materiaal</i>	(4)
6.3	must have good lighting floor must be painted black floor boards must be diagonal	<i>Moet goeie beligting hê</i> <i>Vloer moet swart geverf wees</i> <i>Vloerpanele moet diagonaal wees</i>	(3)
6.4	job number number to be manufactured type of material to be used diameter of holes to be drilled	<i>Werksonommer</i> <i>Hoeveelheid wat gemaak moet word</i> <i>Tipe materiaal wat gebruik moet word</i> <i>diameter van gate wat geboor moet word</i>	(4)
6.5	template paper (thick paper) hard board plastic thin plate wood thick plate	<i>Maatvormpapier</i> <i>(dik papier)</i> <i>Hardebord</i> <i>Plastiek</i> <i>Dun plaat</i> <i>Hout</i> <i>Dik plaat</i>	(4)
6.6	ANY FIVE TOOLS	ENIGE SES GEREEDSKAPSTUKKE	(5) [40]

TOTAL / TOTAAL: 200