

MARKING SCHEME
FORM 2 TERM 3 2018

$$\begin{aligned} 1. \quad & \frac{-12 \div 3 \times 4 - (-15)}{-5 \times 2 + -5} \\ & = \frac{-16 + 15}{-10 - 5} \quad \checkmark \text{ M1} \\ & = \frac{-1}{-15} \quad \checkmark \text{ M1} \\ & = \frac{1}{15} \quad \checkmark \text{ A1} \end{aligned}$$

$$\begin{aligned} 2. \quad & \frac{\frac{2}{5} \div \frac{1}{2} \times \frac{4}{9} - \frac{1}{10}}{\frac{1}{8} - \frac{1}{6} \times \frac{3}{8}} \\ & = \frac{\frac{2}{5} \div \frac{1}{2} \times \frac{4}{9} - \frac{11}{10}}{\frac{1}{8} - \frac{1}{16}} \quad \checkmark \text{ M1} \\ & = \frac{\frac{2 \times 4}{5 \times 2} - \frac{11}{10}}{\frac{1}{16}} \\ & = \frac{\frac{4}{5} - \frac{11}{10}}{\frac{1}{16}} \quad \checkmark \text{ A1} \\ & = \frac{\frac{8}{10} - \frac{11}{10}}{\frac{1}{16}} \\ & = \frac{-\frac{3}{10}}{\frac{1}{16}} \quad \checkmark \text{ A1} \end{aligned}$$

Form 2 · MATHEMATICS MWAKICAN TERM 2 YEAR 2015

1. $-12 \div 3 \times 4 - (-15)$

$$\frac{-5 \times 2 + -5}{-10 - 5}$$

$$= \frac{-16 + 15}{-10 - 5} \quad \checkmark \text{ M1}$$

$$= \frac{-1}{-15} \quad \checkmark \text{ M1}$$

$$= \frac{1}{15} \quad \checkmark \text{ A1}$$

2. $\frac{2}{5} \div \frac{1}{2} \text{ of } \frac{4}{9} - 1\frac{1}{10}$

$$\frac{1 - \frac{1}{6} \times \frac{3}{8}}{\frac{1}{8} - \frac{1}{16}}$$

$$= \frac{\frac{2}{5} \div \frac{1}{2} \times \frac{4}{9} - \frac{11}{10}}{\frac{1}{8} - \frac{1}{16}} \quad \checkmark \text{ M1}$$

$$= \frac{\frac{2 \times 9}{5 \times 2} - \frac{11}{10}}{\frac{1}{16}}$$

$$= \frac{7}{10} \times \frac{16}{1} \quad \checkmark \text{ A1}$$

$$= \frac{112}{10}$$

$$= 11\frac{1}{5} \quad \checkmark \text{ A1}$$

3. $3y + 2x = 6$

$$y = -\frac{2}{3}x + 2$$

gradient of $l_1 = \frac{3}{2}$ ✓ B1

$$\frac{y-4}{x-3} = \frac{3}{2} \quad \text{✓ m1}$$

$$\frac{y-4}{x+3} = \frac{3}{2}$$

$$4y - 8 = 3x + 9$$

$$4y = 3x + 17 \quad \text{✓ A1}$$

4.

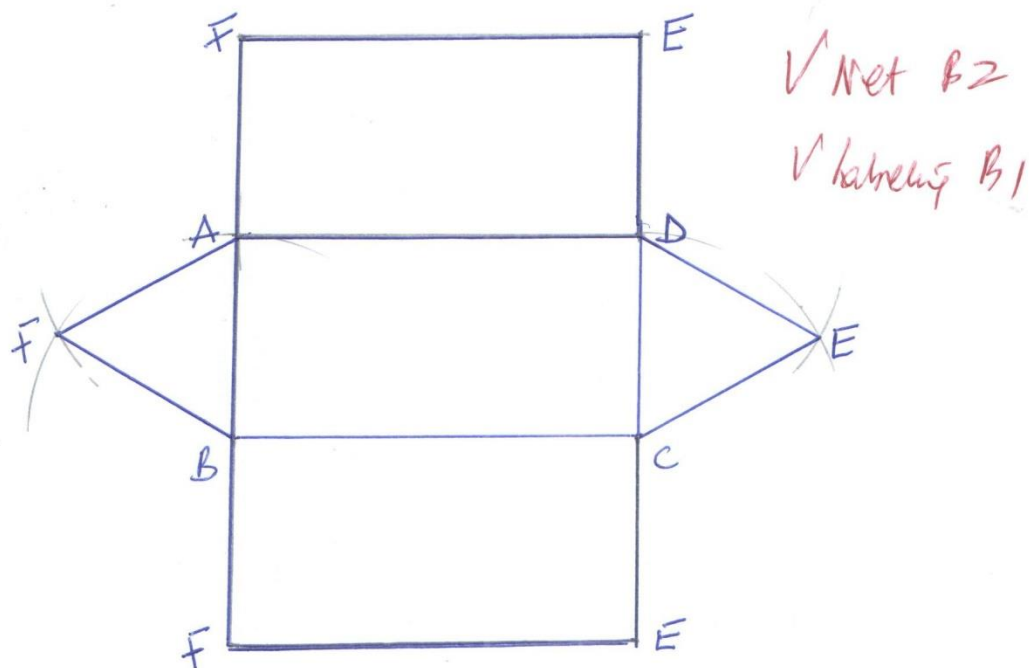
No	log
3.521	0.5467
0.8921	7.9504 ⁺
	0.4971
795.3	2.9005 ⁻
	3.5966 ÷ 4
7.929×10^{-1}	1.8992

All logs ✓ 2ms

✓ operation 1ms

Accuracy 1

5.



6. $OD = \sqrt{15^2 - 12^2}$ ✓ M1
 $= \sqrt{81} = 9$

Area of $\triangle ADC = \frac{1}{2} \times 30 \times 9$ ✓ M1
 $= 135 \text{ cm}^2$

Area of kite $= 2 \times 135 \text{ cm}^2$ ✓ A1
 $= 270 \text{ cm}^2$

7. let the no. 500 notes be x & 100 notes be y .

$$500x + 100y = 700 \Leftrightarrow x + 2y = 14 \quad \text{--- (1)}$$

$$x + y = 11$$

} Both Eqn ✓
M1

$$\begin{array}{r} x + 2y = 14 \\ x + y = 11 \\ \hline \end{array}$$

$$y = 3$$

$$\Rightarrow x = 8$$

✓ Attempt to solve M1

} Both ✓ A1

8. $\frac{AE}{EC} = \frac{ED}{BE} = \frac{1}{5}$

$$\frac{DE}{12-DE} = \frac{1}{5}$$

✓ M1

$$5DE = 12 - DE$$

$$6DE = 12$$

✓ M1

$$\therefore DE = \frac{12}{6} = 2 \text{ cm. } \checkmark \text{ A1}$$

9. $\cos(x+60^\circ) = \cos 2x$

$$x+60 + 2x = 90^\circ$$

✓ M1

$$3x = 30^\circ$$

$$\therefore x = 10^\circ \checkmark \text{ A1}$$

$$\tan(x+60^\circ) = \tan 70^\circ$$

$$= 2.747 \checkmark \text{ B1}$$

10. Commission on Sh100,000 = $\frac{2.4}{100} \times 100000$ ✓ B1
 = 2400

Commission on Sh180000 = $\frac{1.5}{100} \times 180000$ ✓ B1
 = 2700

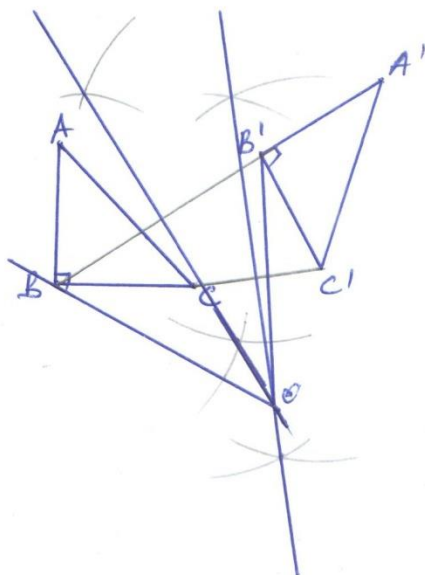
Total Commission = 2400 + 2700 = Sh5100 ✓ B1

11. $y = 180^\circ - 130^\circ = 50^\circ$ ✓ B1

$z = 83^\circ + 50^\circ = 133^\circ$ ✓ B1

$x = 180^\circ - 133^\circ = 47^\circ$ ✓ B1

13.



✓ bisectors B1

✓ intersecting at O B1

L of Pthia = $-53^\circ \pm 1^\circ$ ✓ B1

$$12. \quad A.S.F = \frac{12}{108} = \frac{1}{9}.$$

$$L.S.F = \frac{1}{3} \quad \checkmark B1$$

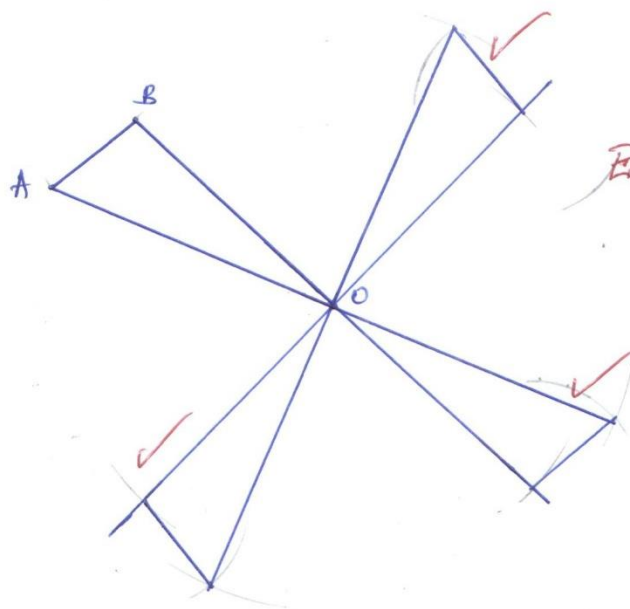
$$V.S.F = \left(\frac{1}{3}\right)^3 = \frac{1}{27}$$

$$\frac{V_s}{V_r} = \frac{1}{27} \quad \checkmark m1$$

$$\frac{V_s}{810} = \frac{1}{27}$$

$$V_s = \frac{1}{27} \times 810 \\ = 30 \text{ cm}^3 \quad \checkmark A1$$

14.



Each part V & V_{mple}
 $\checkmark B1$

total 3

$$15. \text{ Vol. of tank} = 2.4 \times 2.8 \times 3 \times 1000 \text{ L} \quad \checkmark M \\ = 20160 \text{ L.}$$

$$\text{Vol. of water} = 20160 - 3600 = 16560 \text{ L} \quad \checkmark M$$

$$\text{Time} = \frac{16560}{0.5} = 33120 \text{ s.} \quad \checkmark M$$

$$= \frac{33120}{3600} = 9 \text{ hr } 12 \text{ min.} \quad \checkmark A1$$

$$16. \quad x + \frac{1}{3}x = 180^\circ \quad \checkmark B1$$

$$\frac{4x}{3} = 180^\circ$$

$$x = 180 \times \frac{3}{4} = 135^\circ \quad \checkmark B1$$

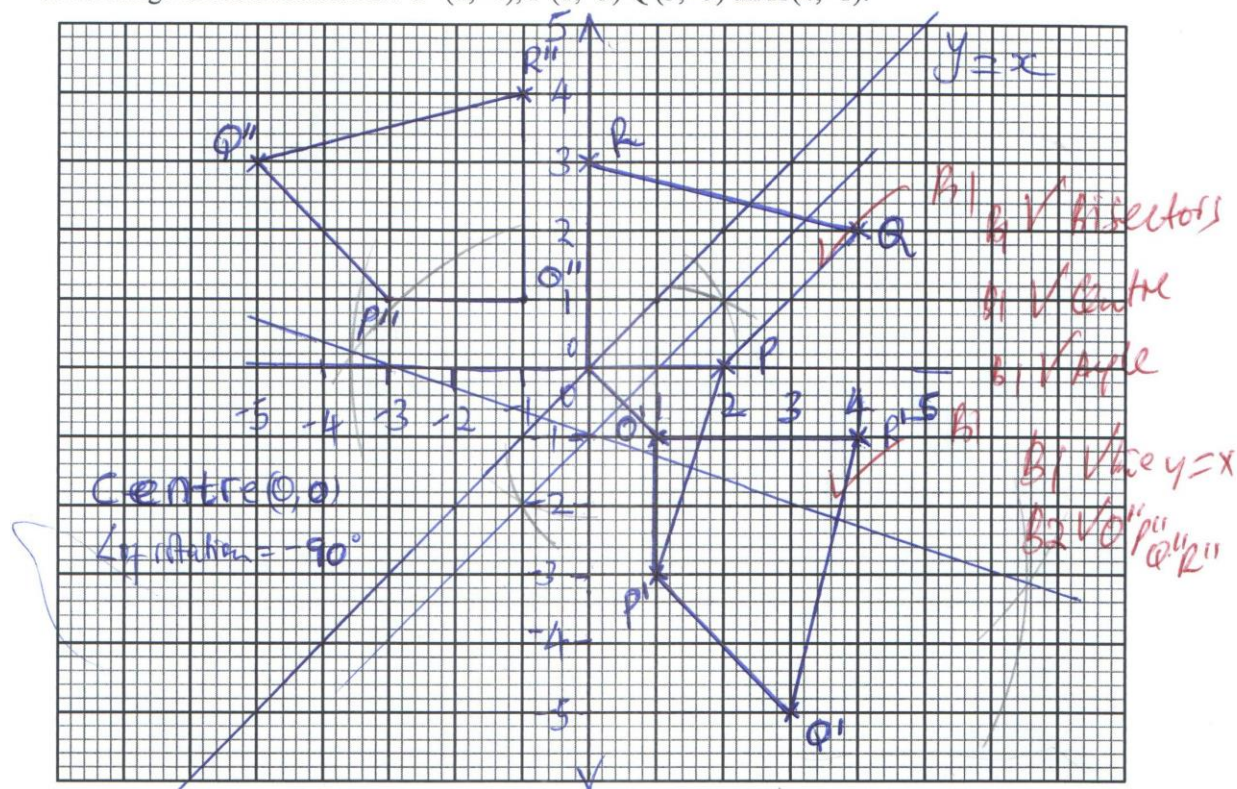
$$\text{Int. } \angle = \frac{135}{3} = 45^\circ.$$

$$\text{No. of sides} = \frac{360^\circ}{45^\circ} \quad \checkmark B1 \\ = 8.$$

SECTION II (50MKS)

Answer 5 questions only in this section

17. The vertices of quadrilateral OPQR are O (0, 0), P (2, 0), Q (4, 2) and R (0, 3). The vertices of its image under a rotation are O' (1, -1), P'(1, -3), Q'(3, -5) and R'(4, -1).



- (a) (i) On the grid provided, draw OPQR and its image O'P'Q'R' (2marks)
 (b) (ii) By construction, determine the centre and angle of rotation. (3marks)
- (c) On the same grid as (a) (i) above, draw O''P''Q''R'', the image of O'P'Q'R' under a reflection in the line $y = x$ (3marks)
- (d) From the quadrilaterals drawn, state the pairs that are:
- (i) Directly congruent; (2marks)
 Quadrilateral OPQR & O'P'Q'R' ✓ B2
- (ii) Oppositely congruent (2marks)
 (i) Quadrilateral OPQR & O''P''Q''R'' ✓ B1
 (ii) " O'P'Q'R' & O''P''Q''R'' ✓ B1

$$18.(9) \quad \left. \begin{aligned} 2000g + 15000b &= 190000 \\ 4000g + 15000(b-3) &= 185000 \end{aligned} \right\} \checkmark$$

$$\begin{aligned} 2g + 15b &= 190 \quad \checkmark \\ 4g + 15b &= 230 \quad \checkmark \end{aligned}$$

$$2g = 40 \quad \checkmark$$

$$g = 20 \quad \checkmark$$

$$b = 10 \quad \checkmark$$

$$\therefore \begin{aligned} \text{no. of goats} &= 20 \\ \text{no. of bulls} &= 10 \end{aligned}$$

$$(b) \quad \text{profit from goats} = \frac{25}{100} \times 2000 \times 20 \quad \checkmark$$

$$= 10,000$$

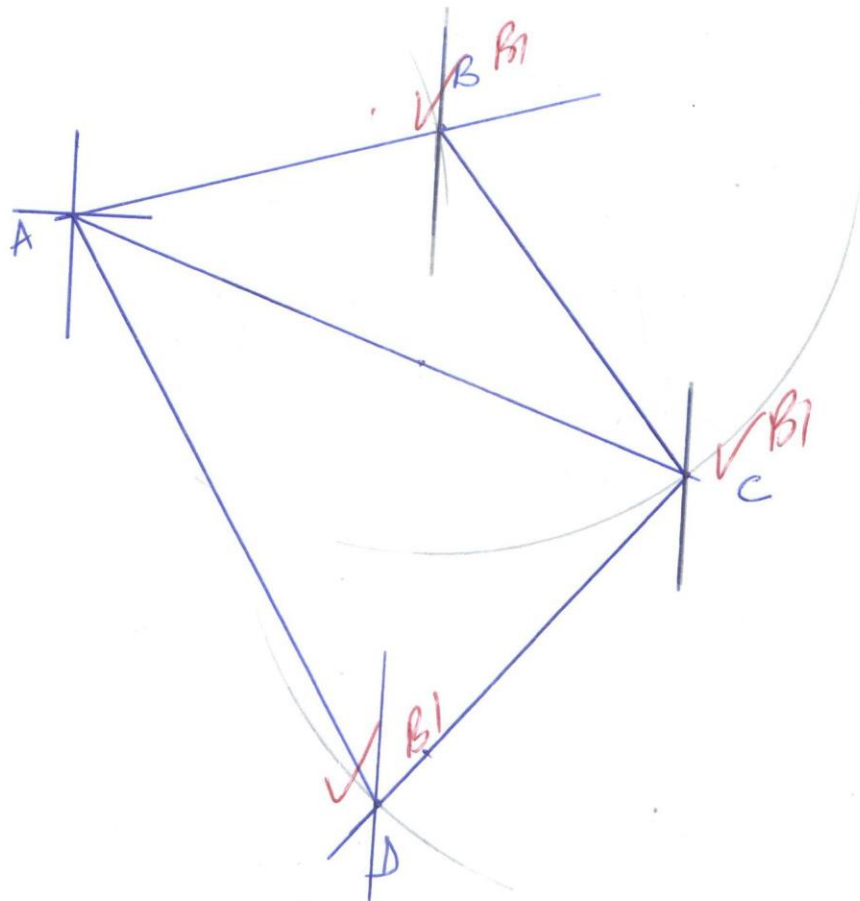
$$\text{profit from bulls} = \frac{30}{100} \times 15000 \times 10 \quad \checkmark$$

$$= 45000$$

$$\begin{aligned} \text{Total profit} &= 10000 + 45000 \quad \checkmark \\ &= \text{Sh } 55000 \quad \checkmark \end{aligned}$$

19(a)

Scale $\checkmark B_1$



(b)(i) $AC = 8.7 \times 50 = 435 \text{ km}$

(ii) Bearing of B from C = 320°

(iii) $AD = 8.8 \times 50 = 440 \text{ km}$
 Bearing 330°

$$20. (i) \text{ Sales} = 360 \times 500 = 180,000 \quad \checkmark \text{ M}$$

$$\begin{aligned} \text{Commission} &= \frac{20}{100} \times 80,000 \\ &= \text{Sh } 16,000 \quad \checkmark \text{ M} \end{aligned}$$

$$\begin{aligned} \text{Total Earnings} &= 16,000 + 12,000 \\ &= \text{Sh } 28,000 \quad \checkmark \text{ A1} \end{aligned}$$

$$(ii) \text{ Salary} = \frac{110}{100} \times 12,000 = \text{Sh } 13,200 \quad \checkmark \text{ M}$$

$$13,200 + \text{Commission} = 17,600$$

$$\begin{aligned} \text{Commission} &= 17,600 - 13,200 \\ &= 4,400 \quad \checkmark \text{ M} \end{aligned}$$

$$\frac{120}{100} (x - 100,000) = 4,400 \quad \checkmark \text{ M}$$

$$\begin{aligned} (x - 100,000) &= \frac{4,400 \times 100}{120} \\ &= 22,000 \end{aligned}$$

$$\therefore x = \underline{\underline{\text{Sh } 122,000}} \quad \checkmark \text{ A1}$$

$$(iii) \text{ No. of handbags} = \frac{122,000}{500} \quad \checkmark \text{ M}$$

$$= 244 \quad \checkmark \text{ A1}$$

22 (g) Total cost of importing 5 tonnes

$$= \frac{140}{100} \times 350 \times 5 + \frac{8}{10} \times 350 \times 5 \quad \checkmark \text{ M1}$$

$$= 2450 + 140 \quad \checkmark \text{ M1}$$

$$= 2590 \text{ dollars.} \quad \checkmark \text{ M1}$$

$$\text{In Ksh} = 2590 \times 82.40 \quad \checkmark \text{ M1}$$

$$= 213416 \quad \checkmark \text{ A1}$$

16% S.P of a 216 pkt.

$$= \frac{213416 \times 2}{5 \times 1000} \quad \checkmark \text{ M1}$$

$$= \text{Ksh } 85.37$$

$$\text{S.P} = \frac{125}{100} \times 85.37 \quad \checkmark \text{ M1}$$

$$= \text{Ksh } 106.70 \quad \checkmark \text{ A1}$$

$$(c) P = \frac{25}{100} \times \frac{213416}{5} \quad \checkmark \text{ M1}$$

$$= \text{Ksh } 10670.80 \quad \checkmark \text{ A1}$$

$$23. (a) \text{ SR} = .5 \tan 33.9^\circ \text{ m}$$

$$= 3.360 \text{ m. A1}$$

$$\text{QR} = \frac{3.360}{\tan 48.2^\circ} \text{ m}$$

$$= 3.004 \text{ m A1}$$

$$(b) \text{ SP} = \frac{3.36}{\sin 33.9^\circ} \text{ m}$$

$$= 6.024 \text{ A1}$$

$$\text{SQ} = \frac{3.36}{\sin 48.2^\circ} \text{ m}$$

$$= 4.507 \text{ m A1}$$

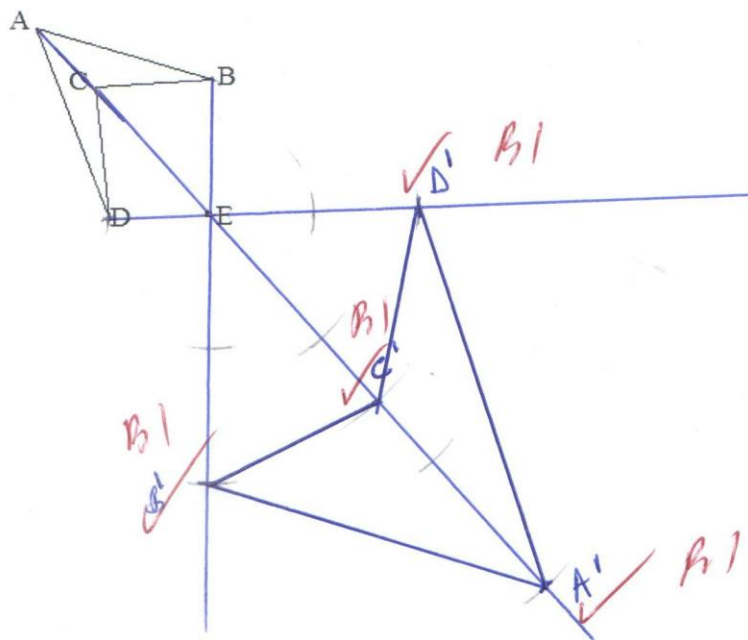
$$(c) \text{ Length of wire} = 4.507 + 6.024$$

$$\approx 11 \text{ m. } \checkmark \text{ B1}$$

$$\text{Total cost} = 11 \times 233 + 1600$$

$$= \text{Sh } 4163 \checkmark \text{ B1}$$

24. a) Construct the image of quadrilateral ABCD under enlargement scale factor -2 center of enlargement E.



- b) A model of a freezer has a rectangular shutter measuring 4cm by 2cm. The area of the actual shutter of the freezer is 0.72m^2 .
- i) Given that the actual freezer is 2.7m long, calculate the length of the model in centimeters.

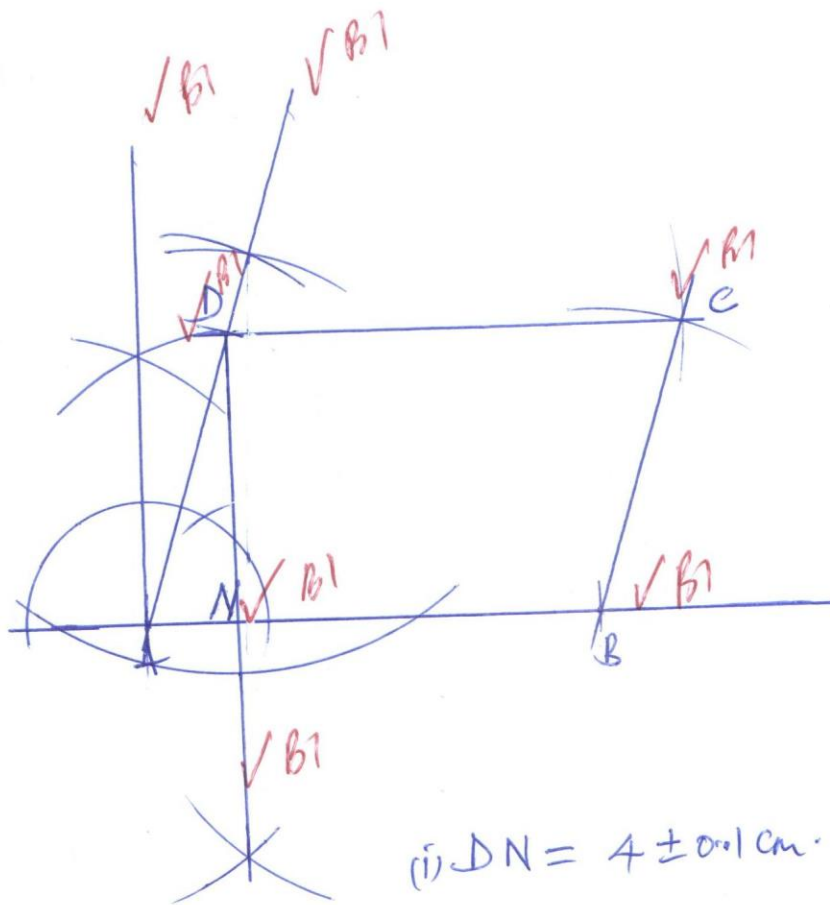
$$\begin{aligned} \text{Area of freezer} &= 8\text{cm}^2 && (3\text{mks}) \\ \text{A.S.F} &= 8:7200 \\ &= 1:900 \\ \text{L.S.F} &= 1:30 \quad \checkmark \text{ B1} \end{aligned}$$

$$\begin{aligned} \frac{L}{2.7} &= \frac{1}{30} \quad \checkmark \text{ M1} \\ L &= \frac{2.7}{30} \\ &= \frac{270}{30} \\ &= 9\text{cm} \quad \text{A1} \end{aligned}$$

- ii) Calculate the volume in m^3 of the actual freezer if the models volume is 12cm^3

$$\begin{aligned} \text{V.S.F} &= \left(\frac{1}{30}\right)^3 = \frac{1}{27000} \quad \checkmark \text{ B1} && (3\text{mks}) \\ \frac{12}{V} &= \frac{1}{27000} \quad \checkmark \text{ M1} \\ \Rightarrow V &= \frac{12 \times 27000}{1} \text{cm}^3 = 324000 \text{cm}^3 = 0.324 \text{m}^3 \quad \checkmark \text{ A1} \end{aligned}$$

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(i) $DN = 4 \pm 0.1 \text{ cm} \cdot \sqrt{B1}$

(ii) Area of $19\text{m} = 6 \times 4 \text{ m}^2$
 $= 24 \text{ cm}^2 \text{ A1}$