



education

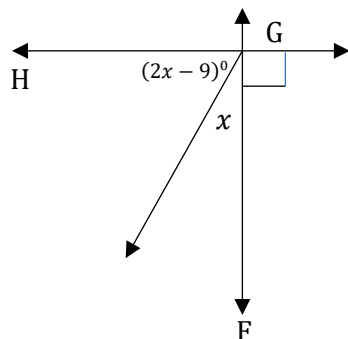
Department of
Education
FREE STATE PROVINCE

GRADE 9
MATHEMATICS PAPER 2 ENGLISH
MARKING GUIDELINE
NOVEMBER 2022

This mathematics marking guideline consist of 13 pages

QUESTION 1

1.1

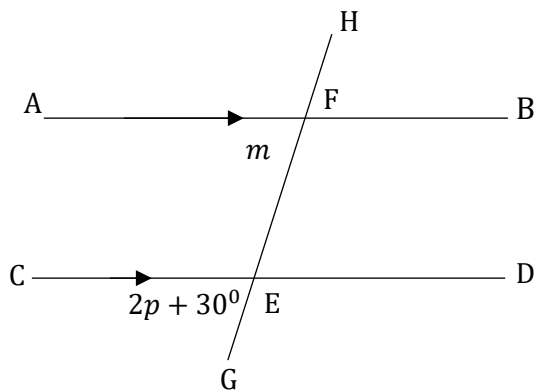


Statement	Reason
$x = \frac{90^\circ + 9^\circ}{3}$	Compl. angles add up to 90°
$= 33^\circ$	

Statement: 1 mark
Reason: 1 mark
Answer: 1 mark

(3)

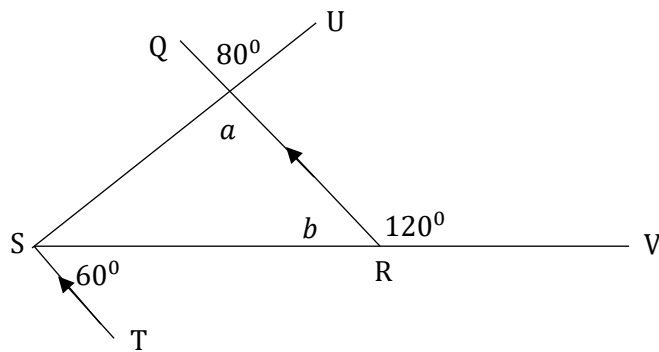
1.2



Statement	Reason
$p = \frac{110^\circ - 30^\circ}{2}$	Corr, angles AB $\parallel$ CD
$= 40^\circ$	

Statement: 1 mark
Reason: 1 mark
Answer: 1 mark

(3)

1.3.1


Statement	Reason
$a = 80^\circ$	Vert. opp angles
$b = 60^\circ$	Alt. angles, $ST \parallel UR$ OR
$b = 60^\circ$	Angles on a str. line

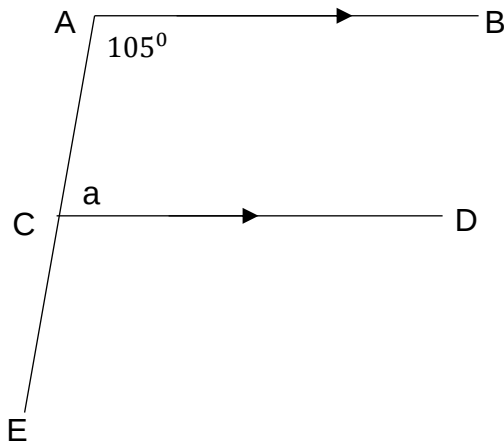
Statement: 1 mark

(4)

Reason: 1 mark

Statement: 1 mark

Reason: 1 mark

1.3.2


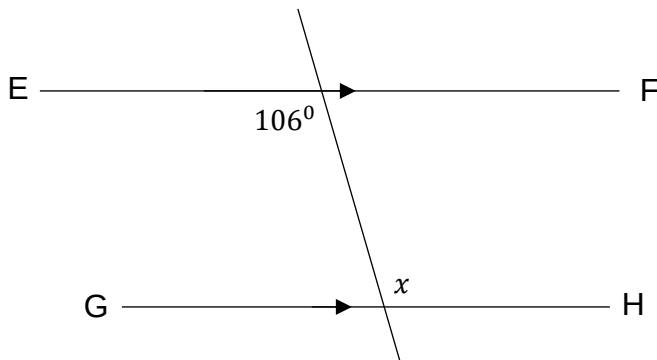
Statement	Reason
$a = 75^\circ$	Co-int, angles, $AB \parallel CD$

Statement: 1 mark

(2)

Reason: 1 mark

1.3.3



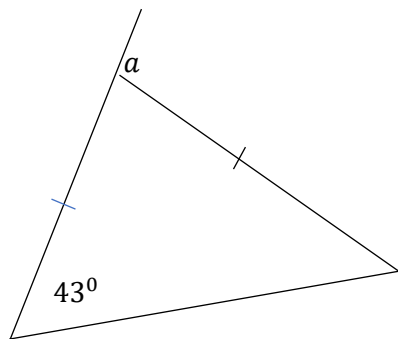
Statement	Reason
$x = 106^\circ$	alt, angles, $EF \parallel GH$

Statement: 1 mark

(2)

Reason: 1 mark

1.3.4



Statement	Reason
$a = 2(43^\circ) = 86^\circ$	Ext. angle of Δ = twice int. angle of a Δ

Statement: 1 mark

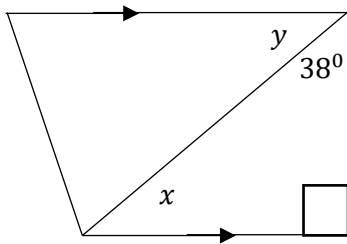
(2)

Reason: 1 mark

[16]

QUESTION 2

2.1



Statement	Reason
$x = 52^\circ$	Int. angles of a Δ add up 180°
$y = 52^\circ$	Alt, angles, $\parallel$ lines

Statement: 1 mark

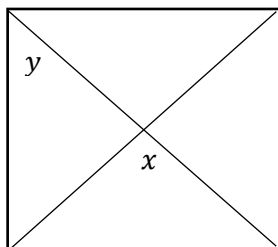
(4)

Reason: 1 mark

Statement: 1 mark

Reason: 1 mark

2.2



Statement	Reason
$x = 90^\circ$	Diag. bisect each other $\perp$
$y = 45^\circ$	Diag. bisect the corners

Statement: 1 mark

(4)

Reason: 1 mark

Statement: 1 mark

Reason: 1 mark

[8]

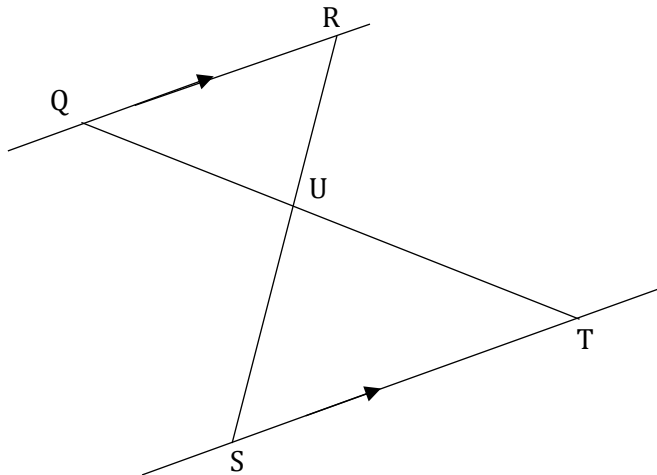
QUESTION 3

3.1 i. SSS or ii. AAS or iii. SAA or iv. RHS

One answer: 1 mark

(1)

3.2



In $\triangle QRU$ and $\triangle TSU$

Statement	Reason
$\widehat{RQT} = \widehat{QTS}$	alt angle, $QR \parallel ST$
$\widehat{QRS} = \widehat{TSR}$	alt angle, $QR \parallel ST$
$\widehat{QUR} = \widehat{TUS}$	vert. opp. angles
$\therefore \triangle QRU \cong \triangle TSU$	equal angles or AAA

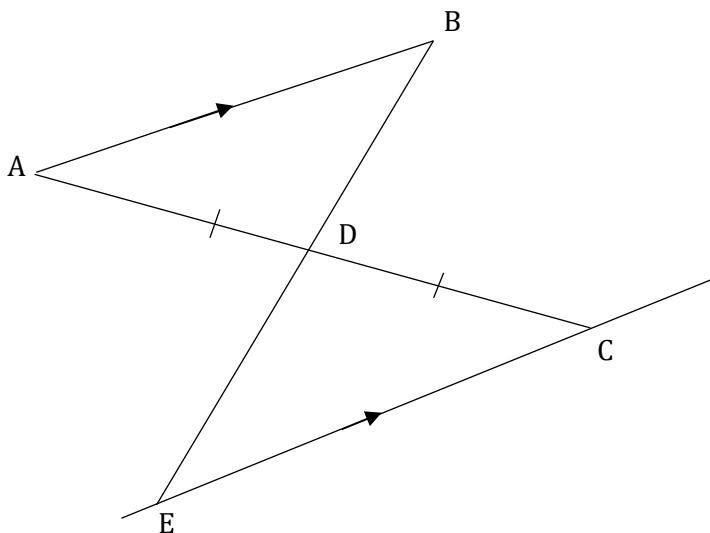
$\widehat{TSR}$: 1 mark

Reason: 1 mark

$\widehat{QUR}$: 1 mark

(3)

3.3



Statement	Reason
In $\triangle ABD$ and $\triangle CED$	
$AD = DC$	given
$\widehat{ADB} = \widehat{CDE}$	Vert. opp. angles
$\widehat{BAD} = \widehat{ECD}$	Alt. angles, $AB \parallel EC$
$\triangle ABD \equiv \triangle CED$	AAS

Statement & Reason: 1 mark

Statement & Reason: 1 mark

Statement & Reason: 1 mark

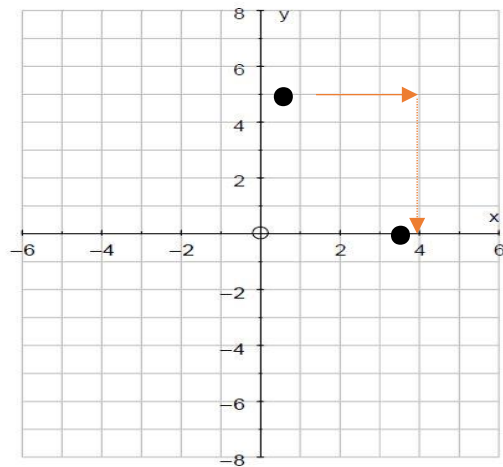
AAS: 1 mark

(4)

[8]

QUESTION 4

4.1.1



Answer/ translate: 1 mark

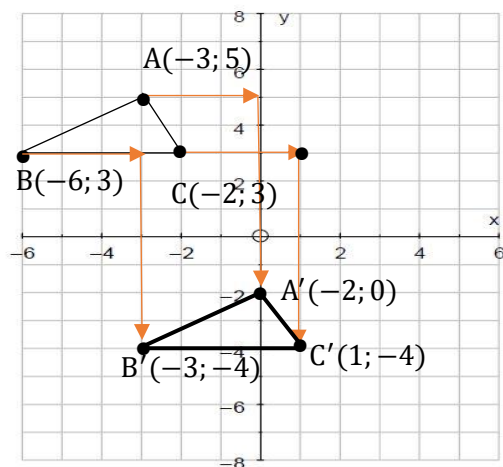
(1)

4.1.2 $A(4; 0)$

Answer: 1 mark

(1)

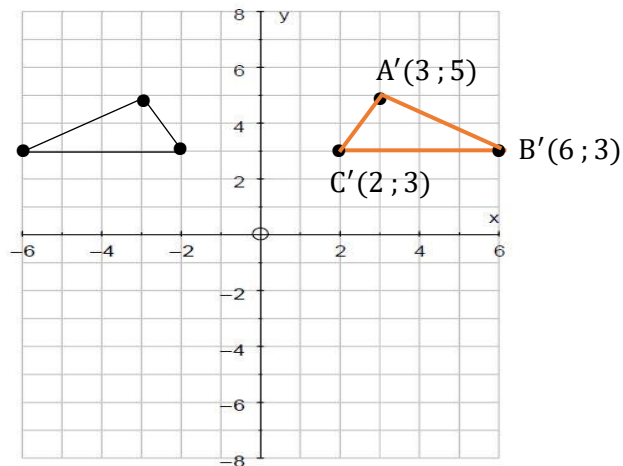
4.2.1



Answer: 1 mark

(1)

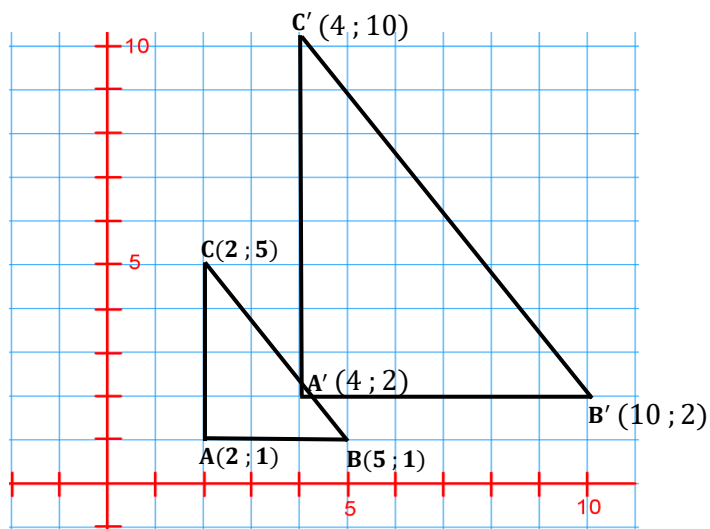
4.2.2



Answer: 1 mark

(1)

4.3



Determine the coordinates of the vertices of $\triangle A'B'C'$

4.3.1

$A'(4; 2)$

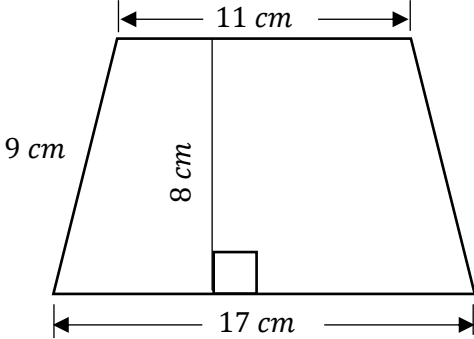
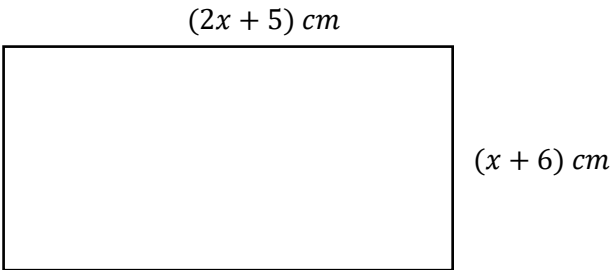
$B'(10; 2)$

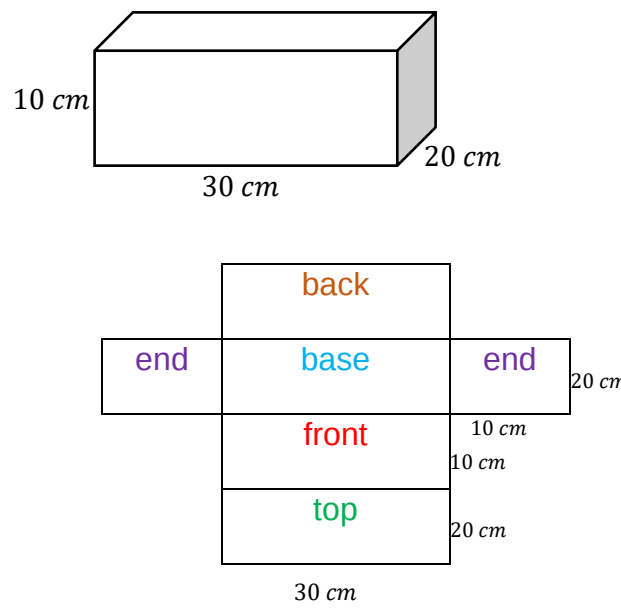
$C'(4; 10)$

Answer: 3 marks

(3)

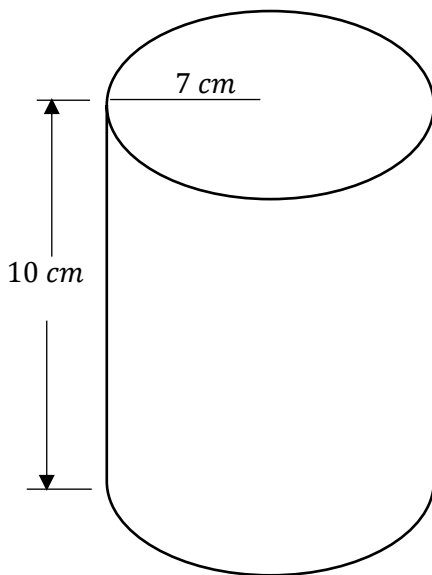
4.3.2	Determine the lengths of the sides of $\triangle A'B'C'$. $A'B' = 6$ units OR (count the blocks) $A'C' = 8$ units OR (count the blocks) $(B'C')^2 = (6)^2 + (8)^2$ (Pythagoras) $= 36 + 64$ $= 100$ $\sqrt{(B'C')^2} = \sqrt{100}$ $BC = 10$ units	Each side: 1 mark	(3)
			[10]
QUESTION 5			
5.1	Diagram of an irregular shape. The top horizontal side is 22 m. The right vertical side is 15 m. The top-left vertical side is 9 m. The bottom-right horizontal side is 8 m. A dashed line indicates a horizontal segment of 14 m and a vertical segment of 6 m. Calculations shown: $15\text{ m} - 9\text{ m} = 6\text{ m}$ and $22\text{ m} - 8\text{ m} = 14\text{ m}$.		
	This is irregular shape $P = 22\text{ m} + 15\text{ m} + 9\text{ m} + 6\text{ m} + 14\text{ m} + 8\text{ m}$ $= 74\text{ m}$	6 m + 14 m: 1 mark Answer: 1 mark	(2)

5.2			
	$Area = \frac{1}{2}(a + b) \times H$ $Area = \frac{1}{2}(11\text{ cm} + 17\text{ cm}) \times 8\text{ cm} \text{ OR } \frac{(11\text{ cm} + 17\text{ cm}) \times 8\text{ cm}}{2}$ $= 28\text{ cm} \times 4\text{ cm}$ $= 112\text{ cm}^2$ $P = 9\text{ cm} + 17\text{ cm} + 9\text{ cm} + 11\text{ cm}$ $= 46\text{ cm}$	Area (answer): 1 mark Perimeter (answer): 1 mark	(2)
5.3	Not drawn to scale.  $P = 46\text{ cm}$ $Area = l \times b$ $= [(2x + 5)(x + 6)]\text{cm}^2$ $= 2x(x + 6) + 5(x + 6)\text{cm}^2$ $= (2x^2 + 12x + 5x + 30)\text{cm}^2$ $= (2x^2 + 17\text{ cm} + 30)\text{cm}^2$	Formula: 1 mark Subst: 1 mark Simplify: 1 mark Answer: 1 mark If a learner did not write the formula, give 2 marks for showing distributive law OR simplifying	(3)

5.4	$1 \text{ km}^2 = 1\,000\,000 \text{ m}^2$ $\therefore 1,12 \text{ square kilometre (km}^2\text{)} = \mathbf{1\,120\,000 \text{ m}^2}$ $= 1,12 \times 1\,000\,000 \text{ m}^2$ $= 1\,120\,000 \text{ m}^2$	Answer: 1 mark	(1)
5.5	Not drawn to scale 		
	Area of base $= (30 \times 20) \text{ cm}^2$ $= 600 \text{ cm}^2$ Area of each end $= (10 \times 20) \text{ cm}^2$ $= 200 \text{ cm}^2$ Area of front $= (10 \times 30) \text{ cm}^2$ $= 300 \text{ cm}^2$ Total surface area $= 2(600 + 200 + 300) \text{ cm}^2$ $= 2 \times 1\,100 \text{ cm}^2$ $= 2\,200 \text{ cm}^2$ OR $SA = 2(l \times b) + 2(h \times b) + 2(h \times l)$ $= 2(30 \times 20) + 2(10 \times 20) + 2(10 \times 30)$ $= 2(600 + 200 + 300)$ $= 1\,200 + 400 + 600$ $= 2\,200 \text{ cm}^2$		(3)

5.6 A cylinder has a radius of 7 cm and height of 10 cm.

Not drawn to scale



5.6.1 Volume of cylinder = $\pi r^2 H$

$$= \frac{22}{7} \times 7 \times 7 \times 10 \text{ cm}$$

$$= 1\,540 \text{ cm}^2$$

Formula: 1 mark

(2)

Answer: 1 mark

5.6.2 TSA = $2\pi rh + 2\pi r^2$

$$= (2 \times \frac{22}{7} \times 7 \times 10) + (2 \times \frac{22}{7} \times 7 \times 7)$$

$$= 440 + 308$$

$$= 748 \text{ cm}^2$$

Formula: 1 mark

(3)

Subst: 1 mark

Answer: 1 mark

5.6.3 Doubled

Answer: 1 mark

(1)

[17]

TOTAL

[60]