



MARKS: 140

This memorandum consists of 9 pages.

Important Information

- This is a marking guideline. In instances where learners have used different but mathematically sound strategies to solve the problems they should be credited.
- Unless stated otherwise, learners who give a correct answer only, should be awarded full marks.
- Apply consistency accuracy and underline errors committed by learners.

KEY	
M	Method mark
CA	Consistent Accuracy mark
A	Accuracy mark

QUESTION 1

1.	1.1	C	1.2	B	1.3	C	1.4	C	1.5	B	Give 1 mark for each correct answer.
	1.6	B	1.7	C	1.8	C	1.9	C	1.10	B	

[10]

QUESTION 2

2.1 $3,56 \times 10^{-6} \text{ A}$

Answer: 1 mark (1)

2.2.1 $(3x)^3 + 2x^3$
 $= 27x^3 + 2x^3 \checkmark \text{ A}$
 $= 29x^3 \checkmark \text{ CA}$

$27x^3 + 2x^3$: 1 mark

Answer = $29x^3$: 1 mark (2)

2.2.2 $\frac{a^2b^2}{ac^2} \times \frac{4a^2bc}{20b^3}$
 $= \frac{4a^4b^3c}{20ab^2c^2} \checkmark \text{ M}$
 $= \frac{a^3}{5c} \checkmark$

Answer: 2 marks
 $\frac{4a^4b^3c}{20ab^2c^2}$: 1 mark
 $\frac{a^3}{5c}$: 1 mark

(2)

- 2.3.1 $4ab(5a^2b^2 + 2ab - 3)$
 $= 20a^3b^3 \checkmark + 8a^2b^2 \checkmark - 12ab \checkmark$ **A**
 Distributive law: 1 mark each term
 $20a^3b^3$: 1 mark
 $8a^2b^2$: 1 mark
 $-12ab$: 1 mark (3)
- 2.3.2 $(2x - 1)^2 - (x + 1)(x - 1)$
 $= 4x^2 - 4x + 1 \checkmark (-x^2 + 1 \checkmark$ **M**
 $= 3x^2 - 4x + 2 \checkmark$ **CA**
 Expanding: 1 mark
 Simplifying: 1 mark
 Answer: 1 mark (3)
- 2.4.1 $8p^3 + 4p^2$
 $= 4p^2 \checkmark (2p + 1) \checkmark$ **A**
 Common factor: 1 mark
 $(2p + 1)$: 1 mark (2)
- 2.4.2 $9p^2 - 36q^2$
 $= 9(p^2 - 4q^2) \checkmark$ **M**
 $= 9(p - 2q)(p + 2q) \checkmark$ **A**
 OR
 $= (3p - 6q)(3p + 6q) \checkmark$ **A**
 $= 3(p - 2q)3(p + 2q)$
 $= 9(p - 2q)(p + 2q) \checkmark$ **A**
 Common factor: 1 mark
 Difference of two squares: 1 mark (2)
- 2.4.3 $tx - ty - 2x + 2y$
 $= t(x - y) \checkmark - 2(x - y) \checkmark$ **M/A**
 $= (x - y) \checkmark (t - 2) \checkmark$ **M/A**
 OR
 $= x(t - 2) \checkmark - y(t - 2) \checkmark$
 $= (t - 2) \checkmark (x - y) \checkmark$ (4)
- 2.5.1 $3(x + 6) = 12$
 $x + 6 = 4 \checkmark$ **M**
 $x = -2 \checkmark$ **CA**
 OR
 $3x + 18 = 12$
 $3x = -6 \checkmark$ **M**
 $x = -2 \checkmark$ **CA**
 Dividing by 3: 1 mark
 Answer: 1 mark
 OR
 -18 both sides: 1 mark
 Answer: 1 mark (2)
- 2.5.2 $x^2 - 2x = 0$
 $x(x - 2) = 0 \checkmark$ **M**
 $x = 0 \checkmark$ or $x = 2 \checkmark$ **CA**
 Common factor: 1 mark
 Answer: 2 marks
 (1 mark per factor) (3)

$$2.5.3 \quad \frac{x+1}{3} - \frac{x-1}{6} = 1$$

Multiplying by 6: 1 mark
Expanding: 1 mark
Answer: 1 mark

$$\begin{aligned} 2(x+1) - (x-1) &= 6 \checkmark \text{ M} \\ 2x + 2 - x + 1 &= 6 \checkmark \text{ CA} \\ x &= 3 \checkmark \text{ CA} \end{aligned}$$

(3)

$$2.5.4 \quad 2^{x+1} = 32$$

$$2^{x+1} = 2^5 \checkmark \text{ M}$$

$$x + 1 = 5 \checkmark \text{ M/CA}$$

$$x = 4 \checkmark \text{ CA}$$

2^5 : 1 mark
Applying exponential law: 1 mark
Answer: 1 mark (3)

[30]

QUESTION 3

$$3.1 \quad \text{Number of boys} = \frac{3}{4} \checkmark \times 240 = 180 \checkmark \text{ M/CA}$$

$\frac{3}{4}$: 1 mark
Answer: 1 mark (2)

$$3.2 \quad \text{Speed} = \frac{\text{distance}}{\text{time}} \checkmark \text{ M/A}$$

$$40 \text{ km/h} = \frac{9 \text{ km}}{\text{time}}$$

$$\text{time} = \frac{9}{40} \times 60 \text{ minutes} \checkmark \text{ M}$$

$$\text{OR } 0,225 \times 60 \text{ minutes}$$

$$= 13,5 \text{ minutes} \checkmark \text{ CA}$$

Formula / Substitution: 1 mark

$$\frac{9}{40} \text{ or } 0,225: 1 \text{ mark}$$

Answer: 1 mark (3)

$$\begin{aligned} 3.3 \quad A &= P(1+i)^n \checkmark \text{ M/A} \\ &= R12\,000(1+0,065)^5 \checkmark \text{ M} \\ &= R16\,441,04 \checkmark \text{ CA} \end{aligned}$$

OR

Year 1: $12\,000 \times 6,5\% = 780$
Year 2: $12\,780 \times 6,5\% = 830,70$
Year 3: $13\,610,7 \times 6,5\% = 884,70$
Year 4: $14\,495,4 \times 6,5\% = 942,20$
Year 5: $15\,437,6 \times 6,5\% = 1\,003,44$
There will be R16 441,04 in his account

Formula: 1 mark
Substitution: 1 mark
Answer: 1 mark (3)

OR

$$\begin{aligned} A &= P \left(1 + \frac{r}{100} \right)^n \checkmark \\ &= R12\,000 \left(1 + \frac{6,5}{100} \right)^5 \checkmark \\ &= R16\,441,04 \checkmark \end{aligned}$$

$$\begin{aligned} 3.4.1 \quad 15\% \text{ cash} &= \frac{15}{100} \times R15\,000 \\ &= R2\,250 \checkmark \text{ A} \end{aligned}$$

Answer: 1 mark (1)

$$\begin{aligned} 3.4.2 \quad A &= P(1+ni) \checkmark \quad \text{CA from 3.4.1} \\ &= R12\,750 \checkmark [1 + 2(0,1)] \checkmark \\ &= R15\,300 \checkmark \end{aligned}$$

OR

$$\begin{aligned} SI &= \frac{Pnr}{100} \checkmark \\ &= \frac{R12\,750 \checkmark (2)(10)}{100} \checkmark \end{aligned}$$

$$= R2\,250$$

$$\text{Total amount} = R12\,750 + R2\,250$$

Formula: 1 mark
Substitution: 2 marks
Answer: 1 mark

OR

Formula: 1 mark
Substitution: 1 mark
Answer: 1 mark
Answer: 1 mark (4)

3.4.3 Monthly payments = $R15\,300 \div 24$ ✓ **CA from 3.4.2**
 $= R637,50$ ✓
 $= R15\,300$ ✓

$R15\,300 \div 24$: 1 mark
 Answer: 1 mark (2)

[15]

QUESTION 4

4.1 18 ✓ and 23 ✓ **A**

Answer: 2 marks
 1 mark per term (2)

4.2 Add 5 to the last term to get the next. ✓ **A**

Correct answer: 1 mark (1)

4.3 $T_n = 5n - 2$ ✓ **A**

Answer: 2 marks (2)

4.4 $T_n = 5n - 2$ **CA from 4.3**
 $38 = 5n - 2$ ✓ **CA**
 $40 = 5n$ ✓ **M**
 $\therefore 8 = n$ ✓ **A**

Substitution into the formula: 1 mark
 Solving equation: 1 mark
 Answer: 1 mark (3)

[8]

QUESTION 5

5.1.1 Parallel ✓ A

Answer: 1 mark (1)

5.1.2 $y = -2$ ✓ A

Answer: 1 mark (1)

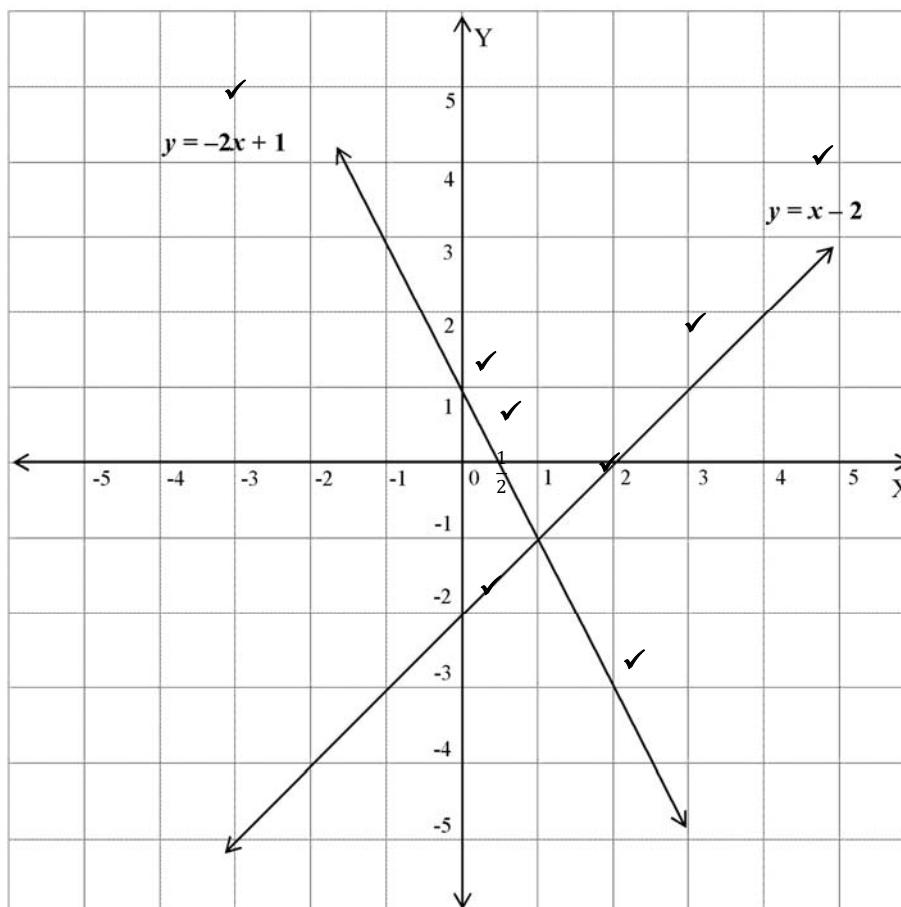
5.1.3 4 ✓ A

Answer: 1 mark (1)

5.1.4 Non-linear ✓ A

Answer: 1 mark (1)

5.2.1



X-intercept and Y-intercept: 2 marks per graph ✓✓ + ✓✓✓

Gradient: 1 mark per graph ✓ + ✓

Correct labelling of graph: 1 mark per graph ✓ + ✓

(8)

5.2.2 At point of intersection: $-2x + 1 = x - 2$ ✓
 $-3x = -3$
 $x = 1$
 and $y = (1) - 2 = -1$ ✓

Equating: 1 mark
 Substitution: 1 mark

(2)

OR

$$y = -2x + 1 \quad \text{If } x = 1; y = (-2(1) + 1) = -1$$

$$y = x - 2 \quad \text{If } x = 1; y = 1 - 2 = -1$$

Therefore, this point lies on both graphs and it must be the point of intersection

[14]

QUESTION 6

6.1	6.1.1	$2x + 3x + 4x = 180^\circ \checkmark$ (T \hat{Q} S is a straight angle) \checkmark M/ A $9x = 180^\circ$ $x = 20^\circ \checkmark$ A	Statement: 1 mark Reason: 1 mark Answer: 1 mark	(3)
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6.1.2	$y = 3x \checkmark$ (alternate \angle s ; PQ RS) \checkmark M $y = 60^\circ \checkmark$ CA for 6.1.1	Statement: 1 mark Reason: 1 mark Answer: 1 mark	(3)
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6.1.3	$\hat{S} = \hat{Q}_1 \checkmark$ (corresponding \angle s; PQ RS) \checkmark M $z = 2x^\circ$ $z = 40^\circ \checkmark$ A
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OR

$$\hat{Q} + \hat{R} + \hat{S} = 180^\circ \checkmark \text{ (sum of } \angle \text{ s of } \Delta = 180^\circ) \checkmark \text{ M}$$

$$4x + y + z = 180^\circ$$

$$80^\circ + 60^\circ + z = 180^\circ$$

$$z = 180^\circ - 140$$

$$z = 40^\circ \checkmark \text{ A}$$

OR

$$\hat{Q}_1 + \hat{Q}_2 = \hat{R} + \hat{S} \checkmark \text{ (ext } \angle \text{ of } \Delta = \text{sum of int opp } \angle \text{ s)} \checkmark \text{ M}$$

$$2x + 3x = y + z$$

$$5x = 60^\circ + z$$

$$100^\circ = 60^\circ + z$$

$$z = 40^\circ \checkmark \text{ A}$$

Statement: 1 mark
Reason: 1 mark
Answer: 1 mark (3)

6.2	$\Delta STV \equiv \Delta ABC \checkmark$ (S, \angle , S) \checkmark A	Statement with vertices in the correct order: 1 mark Reason : 1 mark	(2)
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6.3.1	In ΔABD and ΔACD $AB = AC$ (given) \checkmark A $BD = CD$ (given) \checkmark A $AD = AD$ (common side) \checkmark A $\therefore \Delta ABD \equiv \Delta ACD$ (s, s, s) \checkmark A	Correct statement with reason: 1 mark Correct statement with reason: 1 mark Correct statement with reason: 1 mark Correct deduction and reason : 1 mark	(4)
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OR

In ΔABD and ΔACD
 $\angle ABD = \angle ACD$ (opposite angles of a kite)
 $AB = AC$ (given) \checkmark
 $BD = CD$ (given) \checkmark
 $\therefore \Delta ABD \equiv \Delta ACD$ (s, \angle , s) \checkmark

6.3.2 In $\triangle ABE$ and $\triangle ACE$

$$AB = AC \quad (\text{given}) \checkmark \quad \mathbf{A}$$

$$AE = AE \quad (\text{common side}) \checkmark \quad \mathbf{A}$$

$$\hat{A}_1 = \hat{A}_2 \quad (\text{corr. } \angle \text{ s of congr. } \triangle \text{ s/ bisecting diagonals}) \checkmark \quad \mathbf{A}$$

$$\therefore \triangle ABE \equiv \triangle ACE \quad (\text{s, } \angle, \text{ s}) \checkmark \quad \mathbf{A}$$

OR

In $\triangle ABE$ and $\triangle ACE$

$$AB = AC \quad (\text{given}) \checkmark$$

$$\hat{B}_1 = \hat{C}_1 \quad (\text{Ls opp = sides of } \triangle) \checkmark$$

$$\hat{A}_1 = \hat{A}_2 \quad (\text{corr. } \angle \text{ s of congr. } \triangle \text{ s}) \text{ or } BE = EC \text{ (AD bisects BC)} \checkmark$$

$$ABE \equiv \triangle ACE \quad (\angle, \angle, \text{ s}) \checkmark$$

Correct statement with reason: 1 mark

Correct statement with reason: 1 mark

Correct statement with reason: 1 mark

Correct deduction and reason: 1 mark (4)

6.3.3 $\hat{E}_1 + \hat{E}_2 = 180^\circ$ ($B\hat{E}C$ is str L) $\checkmark \quad \mathbf{A}$

$$\text{But } \hat{E}_1 = \hat{E}_2 \quad (\text{corr. } \angle \text{ of congr. } \triangle \text{ s}) \checkmark \quad \mathbf{A}$$

$$\therefore \hat{E}_1 = \hat{E}_2 = 90^\circ \checkmark \quad \mathbf{A}$$

Correct statement with reason: 1 mark

Correct statement with reason: 1 mark

Conclusion: 1 mark (3)

OR

$$BC \perp AD \quad \checkmark \checkmark \quad (\text{diagonals of a kite}) \checkmark$$

Correct statement: 2 marks

Reason: 1 mark

6.3.4 AE is perpendicular to BC $\checkmark \quad \mathbf{A}$

Answer: 1 mark (1)

$$6.4 \quad \frac{AB}{ED} = \frac{BC}{DF} \quad \checkmark \quad (\text{proportional sides of similar } \triangle \text{ s}) \checkmark \quad \mathbf{A}$$

$$\frac{AB}{6cm} = \frac{15cm}{10cm} \checkmark \quad \mathbf{A}$$

$$AB = \frac{(15)(6)}{10} cm$$

$$AB = 9 cm \checkmark \quad \mathbf{A}$$

Proportional sides and reason: 2 marks

substitution: 1 mark

Answer: 1 mark

(4)

[27]

QUESTION 7

$$7.1 \quad D'(-1; 1) \checkmark \quad E'(1; 1) \checkmark \quad \mathbf{A}$$

Answer: 2 marks

1 mark per pair of co-ordinates

(2)

$$7.2 \quad A'(1; 7) \checkmark \quad B'(1; 1) \checkmark \quad \mathbf{A}$$

Answer: 2 marks

1 mark per pair of co-ordinates

(2)

$$7.3 \quad \text{The perimeter} = (3 + 1,5 + 1 + 1 + 2 + 0,5) \text{ units} = 9 \text{ units} \checkmark \checkmark \quad \mathbf{M/A}$$

Length of reduced sides: 1 mark

Answer: 1 mark

(2)

OR

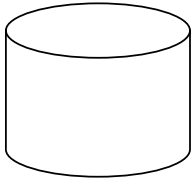
- 7.4 $(6+3+2+2+4+1) \div 2 = 9$ units
 Area of fig. P: Area of reduced fig = 4: 1✓✓ **M/ A**
 OR
 Area of fig P to Area of reduced Fig = 1:0,25 or $1:\frac{1}{4}$
 OR
 Area of fig P to Area of reduced Fig = 10:2,5

Answer: 2 marks
 (Dimensions halved: Area $\frac{1}{4}$ of original) (2)

[8]

QUESTION 8

8.1

3-D figure	Name of figure	No. of faces	No. of vertices	No. of edges	1 mark for each answer
	Cylinder✓	3 faces✓	No vertices✓	2 edges✓	
Shape of the faces: Circles✓ and a rectangle✓					

(6)

- 8.2 The surface area of a rectangular prism is:
 $= 2(l \times b) + 2(l \times h) + 2(b \times h)$
 $= 2(7,2 \times 5)✓ + 2(7,2 \times 3,32)✓ + 2(5 \times 3,32)m^2✓$ **M/ A**
 $= (72 + 47,808 + 33,2) m^2✓$ **CA**
 $= 153,01 m^2✓$ **CA**

Formula/substitution into the correct formula: 3 marks
 Calculation: 1 mark
 Answer: 1 mark
 Wrong formula: 0 marks
 (5)

OR

$$\begin{aligned}
 &2lb + 2(l + b)h✓ \\
 &= 2(7,2 \times 5) + 2(7,2 + 5)3,32✓✓ \\
 &= 72m^2 + 81,01 m^2✓ \\
 &= 153,01 m^2✓
 \end{aligned}$$

- 8.3 Volume of a cylinder = $1\,000\,cm^3$
 $\pi r^2 h = 1\,000\,cm^3✓✓$ **M**
 $\pi(2,82)^2 h = 1\,000\,cm^3✓$ **M**
 $h = 40,0268\,cm \approx 40\,cm✓$ **CA**

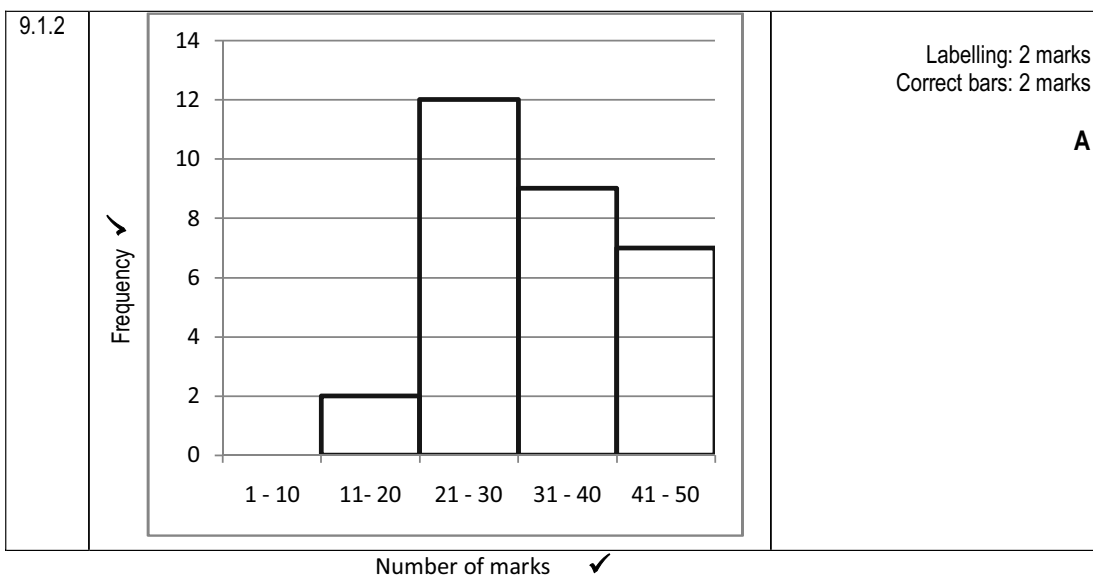
Formula: 1 marks
 Substitution: 1 mark
 Calculation: 1 mark
 Answer: 1 mark
 (4)

[15]

QUESTION 9

9.1.1	Class Interval	Tally marks	Frequency	1 mark per correct interval
	1 – 10	—	0	
	11 – 20	II	2	✓
	21 – 30	II	12	✓
	31 – 40		9	✓
	41 – 50	II	7	✓
				A

(4)



(4)

9.2.1 Range = $10 - 5 = 5$ ✓ **A**

Range: 1 mark

Median: 1 mark

(2)

5 5 6 7 8 8 9 9 9 10

Median = 8 ✓ **A**

9.2.2 Mode = 5 ✓

Answer: 1 mark

(1)

9.2.3 Mean = $\frac{5+7+7+5+5+5+7+5+5+8+6}{10}$ ✓ **M**

Formula: 1 mark

Answer: 1 mark

(2)

= 6 ✓ **A**

[13]

TOTAL: 140

