Exam exemplar (June): Memorandum

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Paper I: Algebra (Marks: 75)

Question 1

No	N	Z	Q	Q
$-\frac{3}{7}$			✓	
$\sqrt{5}$				✓
$\frac{3}{7}$		✓	✓	
$-\sqrt{16}$		✓	✓	

[6]

Question 2

2.1.1 $4{,}62 \times 10^{6}$ ✓ (1)

2.1.2 $2{,}37 \times 10^{-4}$ ✓ (1)

2.2 $2{,}982 \times 10^{7}$ ✓ (1)

2.3 $1{,}496 \times 10^{8}$ ✓✓ (2)

2.4 $2{,}062 \times 10^{7}$ ✓✓ (2)

[7]

Question 3

3.1 1 4 9 16 25 (6th row is $6^2 = 36$) 1^2 2^2 3^2 4^2 5^2 6^2 ✓ ✓

$\therefore 7^2 = 49$ ✓ (3)

3.2 1^2 2^2 3^2 4^2 5^2 (6^2)

$\therefore 7^2 = 49$

✓ ✓

$T_n = n^2$ ✓ (3)

3.3

3	7	13	21	31	43
57	73	91	111	133	
157	183	211	241	273	
26	28	30	32		
307	343	381	421	463	
34	36	38	40	42	
507	553	601	(651)		
44	46	48	50		✓✓✓✓

(4)

[10]

Question 4

4.1 $7^2 + 1 = 50$ ✓✓ (2)

4.2 $\frac{5^6}{5^2} = 5^4$ ✓✓ (2)

4.3 $2^2\,x^4 = 4x^4$ ✓✓ (2)

4.4 $-27a^3$ ✓✓ (2)

4.5 $\frac{p^2r^4}{p^2r^7} = \frac{1}{r^3}$ ✓✓ (2)

4.6 $\frac{2b^2}{3a^2}$ ✓✓✓ (3)

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Question 5

5.1 $2x + 7 = 6x - 9$
$4x = -16$ ✓
$x = 4$ ✓ (2)

5.2 $2x - 6 - 6x + 3 = 17$
$-4x - 3 = 17$ ✓
$-4x = 20$ ✓
$x = -5$ ✓ (3)

5.3 $2(2x + 1) - 3 \times 4 = x - 1$ ✓
$4x + 2 - 12 = x - 1$ ✓
$3x - 10 = -1$ ✓
$3x = 9$ ✓
$x = 3$ ✓ (5)

[10]

Question 6

6.1 $-0{,}300; -\frac{1}{4}; 0{,}60; \frac{2}{3}; 1\frac{1}{2}; \frac{31}{20}$ ✓✓✓ (3)

6.2.1 0,571428 ✓

6.2.2 0,3 ✓

6.2.3 $2{,}1\dot{6}$ ✓

6.2.4 0,952380 ✓ (4)

6.3.1 $\frac{13}{20}$ ✓ (1)

6.3.2 $1{,}2 = \frac{11}{9} = 1\frac{2}{9}$ ✓✓ (2)

6.3.3 $\frac{54}{99} = \frac{6}{11}$ ✓✓ (2)

[12]

Question 7

7.1 ✓

x	−2	−1	0	1	5
y	−7	−5	−3	−1	7

✓ ✓ (3)

7.2 $x \rightarrow \times 2 \rightarrow -3 \rightarrow y$ ✓✓ (2)

7.3 $x = 1$ ✓
$y = -7$ ✓ (2)

[7]

Question 8

8.1 310 × 12 × 3 = R11 160
– R10 000 ✓
Interest = R 1 160 ✓ (2)

8.2 $A = P\left(1 + \frac{r}{100}\right)^n$ ✓
$A = 3\,000(1 + 0{,}0945)^4$ ✓✓
= R4 305,11 ✓ (4)

8.3 In 18 months he needs to earn R800 interest.
Therefore, in one month $\frac{R800}{18}$ = R44,44
Therefore, in one year 12 × R44,44 = R533,28
Percentage simple interest p.a. $= \frac{R533{,}28}{R2\,000{,}00} = 0{,}2666 \approx 26{,}7\%$
Check: 12 months: R2 000 × 0,267 = R534
+ 6 months: R2 000 × 0,134 = R268
Total: R802 (4)
[10]

Paper 2: Geometry (Marks: 80)

Question 1

1.1 Learners construct an equilateral triangle with each angle = 60° and each side = 70 mm. ✓✓✓ (3)

1.2 Learners bisect all three angles as instructed. ✓✓✓ **(3)**
[6]

Question 2

2.1.1 ∠ACB = 180° – (∠A + ∠ABC) ✓ (sum of interior angles of a triangle) ✓
= 180° – (34° + 90°)✓
= 56°✓ (4)

2.1.2 ∠ACD = ∠A + ∠ABC ✓ (exterior angle of a triangle theorem) ✓
= 34° + 90°✓
∴ ∠ACB = 124°✓ (4)

2.1.3 BC = 56 mm ✓✓ (2)

2.1.4 AB = $\sqrt{100^2 - 56^2} = \sqrt{6\,864}$ = 82,85 mm (Pythagoras) ✓✓✓✓ (4)

2.2.1 x = 105°✓ (opposite angles of a ||rm) ✓ (2)

2.2.2 In △HEF and △EGH
EF = GH✓ (opposite sides of a ||rm) ✓
HE = FG✓ (opposite sides of a ||rm) ✓
HF is common✓ (diagonal)
∴ △HEF ≡ △FGH (SSS) ✓ (6)

2.3.1 10 sides✓ (1)

2.3.2 8 triangles✓✓ (2)

2.3.3 Sum of interior angles = 180°✓ × 8✓
= 1 440°✓✓ (4)
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Question 3

3.1.1 $\angle A = 60°$✓ ($\triangle ABC$ is equilateral) ✓ (2)

3.1.2 $\angle ADF = \angle B$ ✓ $= 60°$✓ (corresponding angles ✓ DE||BC) ✓ (4)

3.1.3 $FE = \frac{1}{2}DE$✓

But DE = BC = 40 mm ✓ (opposite sides of a ||rm) ✓

$\therefore FE = \frac{1}{2}(40)$ mm ✓

$= 20$ mm ✓ (5)

3.1.4 $\angle EFC = \angle AFD$✓ (vertically opposite angles) ✓

But $\angle AFD = 60°$✓ (sum of interior angles of ΔAFD) ✓

$\therefore \angle EFC = 60°$✓ (5)

3.1.5 In $\triangle ABC$ and $\triangle EDF$

$\angle A$ is common✓

$\angle ADF = \angle B$ ✓ (corresponding angles, DE||BC) ✓

$\therefore \triangle ABC$ ||| ΔADF ✓ ($\angle\angle\angle$) ✓ (5)

3.1.6 $\triangle AFD$ ||| $\triangle CFE$

Since $\angle A = \angle FCE$ ✓ (alternate angles, AB||CE) ✓

$\angle CFE = \angle AFD$✓ (vertically opposite angles)

DF = FE (given)

$\therefore$ condition AAS is satisfied✓ (4)

3.2.1

House shape	Dimensions	Perimeter	Area
Square	Side = 7,5 m✓	30 m	$A = s^2$✓ $= (7,5)^2$✓ $= 56,25\ m^2$✓
Rectangle	Length = 10 m Width = 5 m✓✓	30 m	$A = l \times w$✓ $= (10 \times 5)$ ✓ $= 50\ m^2$ ✓
Circle	Radius $= \frac{30\ m✓}{2\pi✓}$ $= 4,78$ m✓✓	30 m	$A = \pi r^2$✓ $= 71,74\ m^2$✓

(15)

3.2.2 Round (circular) shape✓ (1)

3.2.3 If the circumference doubles, so does the radius and area. ✓

New area = 2 (original area) ✓

$= 2(71,74\ m^2)$✓ $= 143,48\ m^2$✓ (4)

[45]

[Total: 80]