

Exam exemplar (June): Additional Memorandum

Question 1

- 1.1.1** $7x - 3 = 10$
 $-3x = -3 \checkmark$
 $x = 1 \checkmark$ (2)
- 1.1.2** $\frac{2x}{3} = \frac{6 \times 3}{1 \times 3}$
 $\frac{2x}{3} = \frac{18}{2}$
 $x = 9 \checkmark$ (1)
- 1.1.3** $\frac{2(2x+1)}{5 \times 2} = \frac{1 \times 10}{1 \times 10} + \frac{5(x+1)}{1 \times 10}$
 $4x + 2 = 10 + 5x + 5 \checkmark$
 $4x + 2 = 5x + 15 \checkmark$
 $-x = 13$
 $x = -13 \checkmark$ (3)
- 1.1.4.** $10 \geq 8 - x + 7 - 6x + 15 \checkmark$
 $10 \geq 30 - 7x$
 $7x \geq 20$
 $x = \frac{20}{7} \checkmark$
 $\therefore$ No solution, so Dean is correct. $\checkmark$ (3)
- 1.2** $3(x - 2) = 4x - (x + 2) \checkmark$
 $3x - 6 = 4x - x + 2$
 $-6 \neq +2 \checkmark$
 $\therefore$ No solution, so Dean is correct. $\checkmark$ (3)
- 1.3.** LHS = $3 - 4 = -1 \checkmark$
RHS = $\frac{2(-7+4)}{6} = \frac{2(-3)}{6} = -1 \checkmark$
 $\therefore$ LHS = RHS
So the answer is correct. $\checkmark$ (3)

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Question 2

- 2.1.1** $4 \checkmark$ (1)
- 2.1.2** $a^3 \checkmark$ (1)
- 2.1.3** $a^m - m - 1 = a^{-1} \checkmark$ (1)
- 2.2.1** $\frac{a^9 b^6 \times ab^8}{a^2 b^2} \checkmark$ (3)
 $\frac{a^{10} b^2}{a^2 b^2} \checkmark = a^8 \checkmark$
- 2.2.2** $0,0012 \times 0,093 \checkmark$ (3)
 $= 1,116 \times 10^{-4} \checkmark \checkmark$

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Question 3

- 3.1.1** $1 \checkmark$ (1)
- 3.1.2** $4 \checkmark$ (1)
- 3.1.3** $-1 \checkmark$ (1)

3.2 $5 + 3 = 8$ parts (2)
 $\frac{250\,000}{8} = 31\,250 \checkmark$

unskilled = $31\,250 \times 5 = \text{R}156\,250 \checkmark$

3.3 1 toy costs R111,88 $\checkmark$ (2)
 $\times 15 = \text{R}1\,678,20 \checkmark$

3.4 0,333 ... $\checkmark$; $\sqrt[3]{-8} \checkmark$ (2)

3.5.1 $\frac{3}{4} = 3 : 4$
 $\frac{30}{2\,000} = 3 : 200 \checkmark$ (1)

3.5.2 $\frac{13}{17} = \frac{91}{x}$
 $13x = 91 \times 17 \checkmark$
 $x = \frac{91 \times 17}{13} \checkmark$ (2)

3.6 $x = 119 \checkmark \checkmark$ (2)

Question 4

4.1 33 matches $\checkmark$ (1)

4.2 Matches = $\{[(\text{pattern no.} + 2) \times 3] + (\text{pattern no.} - 1)\} \checkmark \checkmark$ (2)

4.3 Pattern 7 $\checkmark \checkmark$ (2)
 [5]

Question 5

5.1 Prime factors of 54: $2 \times 3^3 \checkmark$
 Prime factors of 72: $2 \times 3^2 \checkmark$
 $\therefore \text{HCF} = 2 \times 3^2$
 $= 18 \checkmark$ (3)

5.2 Prime factors of 24 = $2^3 \times 3 \checkmark$
 Prime factors of 36 = $2^2 \times 3^2$
 $\therefore \text{LCM} = 2^3 \times 3^2$
 $= 8 \times 9$
 $= 72 \checkmark$ (3)

5.3 Prime factors of 1 728 = $2^6 \times 3^3 \checkmark$
 $\therefore \sqrt[3]{1\,728} = -3(7 + 2)^2 \checkmark \checkmark$ (3)

5.4 $-\sqrt{9}(\sqrt{49} + \sqrt[3]{8})^2 = -3(7 + 2)^2 \checkmark \checkmark$
 $= -243 \checkmark$ (3)
 [12]

Question 6

6.1 $3a \checkmark - 4 \checkmark$ (2)

6.2 $3(4a^4b^6c^2) \checkmark \checkmark = -12a^4b^6c^2 \checkmark$ (3)

6.3 $14a^3 - 15a^3 \checkmark$ (2)

6.4 $5a + 20 \checkmark - 6a^2 - 9a^2 \checkmark = -15a^2 + 5a + 20 \checkmark \checkmark$ (4)

6.5 $\sqrt{\frac{16x^4}{9y^2}} \checkmark \checkmark = \frac{4x^2}{3y} \checkmark$ (3)

6.6 $2x^2 \checkmark + 3x - 8x - 12 \checkmark = 4x^2 - 5x - 12 \checkmark$ (3)

6.7 $2(x^2 - xy \checkmark + 3xy - 3y^2) \checkmark = 2x^2 + 4xy - 6y^2 \checkmark \checkmark$ (4)

6.8 $9p^2 \checkmark - 24p \checkmark \checkmark + 16 \checkmark$ (4)
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Question 7

- 7.1 A: James: 12,5% simple interest for 5 years.
 B: Oliver: 9,75% simple interest for 6,5 years.
 Interest = Principle $\times$ Rate $\times$ No. of years
 James: $R150\,000 \times 12,5\% \times 5 \checkmark$
 $= R93\,750,00 \checkmark$
 Oliver: $R150\,000 \times 9,75\% \times 6,5 \checkmark$
 $= R95\,062,50 \checkmark$
 Oliver will pay more interest. $\checkmark$ (5)
- 7.2 $R101,43 - R95,34 = R6,09 \checkmark$
 $R6,09 \div R101,43 = 6,00\% \text{ loss } \checkmark \checkmark$ (3)
- 7.3 Cost of car = $R124\,560,00$
 Deposit = 20%
 No. of instalments = 54 months $\checkmark = 6$ years
 Compound interest = 17,25%
 Deposit = 20% of $R124\,560,00$
 $= R24\,912,00 \checkmark$
 $\therefore$ Balance = $R99\,648,00$
 $\therefore$ Monthly payment $\checkmark \checkmark$ (5)

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Question 8

- 8.1.1 $a = 70^\circ \checkmark$ (corresponding $\angle$ s) $\checkmark$ (2)
 8.1.2 $b = 120^\circ \checkmark$ (ext $\angle$ of $\triangle$) $\checkmark$ (2)
 8.1.3 $c = 60^\circ \checkmark$ (alt $\angle$ s) $\checkmark$ (2)
 8.1.4 $d = 90^\circ \checkmark$ (diagonals of a rhombus) $\checkmark$ (2)
 8.1.5 $e = 55^\circ \checkmark$ ($\angle$ s of $\triangle$) $\checkmark$ (2)

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Question 9

- 9.1 Congruent $\checkmark$ (SAS) $\checkmark$ (2)
 9.2 Not congruent, $\checkmark$ angle not included $\checkmark$ (2)
 9.3 Not congruent, $\checkmark$ similar $\triangle$ s $\checkmark$ (2)
 9.4 Congruent $\checkmark$ (ASA) $\checkmark$ (2)

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Question 10

- 10.1.1 $\triangle ABC \parallel \triangle ACB \checkmark$ (SSS) (3)
 10.1.2 ratios = $16 : 20 : 24 \rightarrow 4 : 5 : 6$
 $8 : 10 : 12 \rightarrow 4 : 5 : 6 \checkmark$
 $\therefore x = 8 \checkmark$ (2)

[5]

Question 11

- 11.1 $x^2 = 7^2 + 3^2$ (Pythagoras) $\checkmark$
 $x^2 = 49 + 9$
 $x^2 = 58$
 $x = \sqrt{58}$
 $y^2 = (\sqrt{58})^2 - 4^2$ (Pythagoras) $\checkmark$
 $y^2 = 58 - 16 \checkmark$
 $y^2 = 42 \checkmark$
 $y = \sqrt{42} \checkmark$ (5)

11.2 $(3x)^2 = x^2 + 6^2$
 $9x^2 = x^2 + 36 \checkmark$
 $8x^2 = 36 \checkmark$
 $x^2 = 4 \checkmark$
 $x = \pm 2; x = 2 \checkmark$

(4)
[9]

Question 12

12.1 Circumference = $\frac{\pi(D)}{2} \checkmark$
 $= \frac{\pi^2(76,4)}{2} \checkmark$
 $= 120 \text{ m} \checkmark$

(3)

12.2 $AB + DA = 400 - 2(120)$
 $2AB = 160 \checkmark$
 $AB = 80 \text{ m} \checkmark$

(2)

12.3 Area of circle = πr^2
 $= \pi \left(\frac{76,4}{2}\right)^2 \checkmark$
 $= 4\,584,34 \text{ m}^2 \checkmark$
 Area of rectangle = $80 \times 76,4$
 $= 6\,112 \text{ m}^2 \checkmark$
 Area of pitch = 25×20
 $= 500 \text{ m}^2 \checkmark$
 Unshaded area = $4\,584,36 + 6\,112 - 500 \checkmark$
 $= 10\,196,34 \text{ m}^2 \checkmark$

(6)
[11]

[Total: 135]