



Education and Sport Development

Department of Education and Sport Development
Departement van Onderwys en Sport Ontwikkeling
Lefapha la Thuto le Tlhabololo ya Metshameko

NORTH WEST PROVINCE

GRADE 10

TECHNICAL MATHEMATICS PAPER 1

MID YEAR EXAMINATION MEMORANDUM 2018

MARKS: 75

This memorandum consists of 4 pages

QUESTION 1 [10]

1.1.1	$\sqrt{17}$	✓ answer (1)
1.1.2	$\frac{0}{4}; -\sqrt{16}$	✓✓ each correct answer (2)
1.1.3	$\sqrt{-16}$	✓ answer (1)
1.2	$\frac{3}{7} = 0,428571\dots$ $= 0,429$	✓ decimal ✓ answer to 3 decimal (2)
1.3	$0,000584 = 5,84 \times 10^{-4}$	✓ 5,84 ✓ 10^{-4} (2)
1.4	$\sqrt{16} < \sqrt{17} < \sqrt{25}$ $4 < \sqrt{17} < 5$ \therefore it lies between integers 4 and 5	✓ $\sqrt{16} < \sqrt{17} < \sqrt{25}$ ✓ answer (2)

QUESTION 2 [10]

2.1	111010	✓ ✓ answer (2)
2.2	21	✓ ✓ answer (2)
2.3	$\begin{array}{r} 1011 \\ \times 11 \\ \hline 1011 \\ 10110 \\ \hline 100001 \end{array}$	✓ 10110 ✓ answer (2)
2.4.1	$\begin{aligned} \sqrt{-121} &= \sqrt{-1 \times 121} \\ &= \sqrt{-1} \times \sqrt{121} \\ &= 1i \end{aligned}$	✓ $\sqrt{-1 \times 121}$ ✓ answer (2)
2.4.2	$\begin{aligned} i^{39} &= i^{4 \times 9} \cdot i^3 \\ &= 1 \times i^2 \cdot i \\ &= -i \end{aligned}$	✓ $i^{4 \times 9} \cdot i^3$ ✓ answer (2)

QUESTION 3[18]

3.1.1	$2(2a - 4b) - (3a - 2b) = 4a - 8b - 3a + 2b$ $= a - 6b$	✓ $4a - 8b$ ✓ $-3a + 2b$ ✓ answer (3)
3.1.2	$(3x + 2)(x - 6) = 3x^2 - 18x + 2x - 12$ $= 3x^2 - 16x - 12$	✓ $3x^2 - 18x$ ✓ + $2x - 12$ ✓ answer (3)
3.1.3	$(x - 5)(x^2 + 5x + 25) = x^3 + 5x^2 + 25x - 5x^2 - 25x - 125$ $= x^3 - 125$	✓ $x^3 + 5x^2 + 25x$ ✓ - $5x^2 - 25x - 12$ ✓ answer (3)
3.2.1	$8x^2 - 6x = 2x(4x - 3)$	✓ $2x$ ✓ $(4x - 3)$ (2)
3.2.2	$3x - 6xy - 2y + 1 = 3x(1 - 2y) + (1 - 2y)$ $= (3x + 1)(1 - 2y)$	✓ $3x(1 - 2y)$ ✓ $+(1 - 2y)$ ✓ answer (3)
3.2.3	$x^2 - 9x + 20 = (x - 5)(x - 4)$	✓✓ each bracket (2)
3.2.4	$a^2 - 16b^2 = (a - 4b)(a + 4b)$	✓✓ each bracket (2)

QUESTION 4[19]

4.1.1	$12b^4c^2 \div 6b^3 - 5bc^2 = 2bc^2 - 5bc^2$ $= -3bc^2$	✓ 2 ✓ bc^2 ✓ answer (3)
4.1.2	$\frac{25^{x+2}}{5^{2x-1}} = \frac{5^{2(x+2)}}{5^{2x-1}}$ $= 5^{2x-2x+4+1}$ $= 5^5$ $= 3125$	✓ $5^{2(x+2)}$ ✓ $5^{2x-2x+4+1}$ ✓ simplification ✓ answer (4)
4.2	$3ab^2$	✓ 3 ✓ ab^2 (2)

4.3.1	$\frac{(x-3)}{3} - \frac{(x+2)}{4}$ $\text{LCM} = 12$ $= \frac{4(x-3) - 3(x+2)}{12}$ $= \frac{4x - 12 - 3x - 6}{12}$ $= \frac{x - 18}{12}$	✓ LCM ✓ numerator ✓✓ simplify numerator ✓ answer (5)
4.3.2	$\frac{x^2 - 5x - 6}{x^2 - 1} \times \frac{2x - 2}{x^2 - 6x} = \frac{(x-6)(x+1)}{(x-1)(x+1)} \times \frac{2(x-1)}{x(x-6)}$ $= \frac{2}{x}$	✓✓✓✓ factors of each ✓ answer (5)

QUESTION 5 [18]

5.1.1	$2^x = 32$ $2^x = 2^5$ $\therefore x = 5$	✓ 2^5 ✓ answer (2)
5.1.2	$2(2x - 1) = x + 1$ $4x - 2 = x + 1$ $4x - x = 1 + 2$ $3x = 3$ $\therefore x = 1$	✓ removing brackets ✓ rearranging terms ✓ simplification ✓ answer (4)
5.1.3	$x^2 - 5x = 14$ $x^2 - 5x - 14 = 0$ $(x - 7)(x + 2) = 0$ $x = 7 \text{ or } x = -2$	✓ standard form ✓ factors ✓✓ each answer (4)
5.2.1	$F = \frac{9}{5}C + 32$ $F - 32 = \frac{9}{5}C$ $5F - 160 = 9C$ $\frac{5}{9}F - \frac{160}{9} = C$ $C = \frac{5}{9}F - \frac{160}{9}$	✓ transposing ✓ $5F - 160 = 9C$ ✓ answer (3)

5.2.2	$C = \frac{5}{9}F - \frac{160}{9}$ $C = \frac{5}{9}(50) - \frac{160}{9}$ <p>= 10 degree Celsius</p>	<p>✓ substitution</p> <p>✓ answer</p> <p>(2)</p>
5.3	$1000m = 1km$ $1m = 1 \times 10^{-3} km$ $1m^3 = 1 \times 10^{-9} km^3$ $250m^3 = 250 \times 10^{-9} km^3$ $= 2,5 \times 10^{-7} km^3$	<p>✓ $1m = 1 \times 10^{-3} km$</p> <p>✓ $1m^3 = 1 \times 10^{-9} km^3$</p> <p>✓ answer</p> <p>(3)</p>

TOTAL: 75