



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

MATHEMATICS PAPER 1

MID YEAR EXAMINATION MEMORANDUM 2017

MARKS: 75

This memorandum consists of 6 pages

Marking Memorandum

QUESTION 1

1.1.1	$\sqrt{-16}$	✓ answer (1)
1.1.2	$\frac{\pi}{3}$ and $\sqrt[3]{9}$	✓✓ each answer (2)
1.2	$0,6 = 0,633333\dots$ $\text{let } x = 0,6\overset{i}{3}$ $\therefore 10x = 6,3\overset{i}{} \text{ -----(1)}$ $\therefore 100x = 63,3\overset{i}{} \text{ -----(2)}$ equation (2) - (1) $90x = 57$ $\therefore x = \frac{19}{30}$	✓ equation 1 ✓ equation 2 ✓ $90x = 57$ ✓ answer (4)
1.3	$\sqrt{100} < \sqrt{111} < \sqrt{121}$ $10 < \sqrt{111} < 11$ \therefore it lies between integers 10 and 11	✓ $\sqrt{100} < \sqrt{111} < \sqrt{121}$ ✓ answer (2)

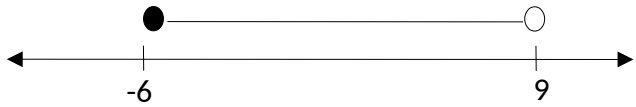
Marking Memorandum

QUESTION 2

2.1.1	$(2x+3y)(-7x+4y) = -14x^2 + 8xy - 21xy + 12y^2$ $= -14x^2 - 3xy + 12y^2$	✓ removing brackets ✓ answer (2)
2.1.2	$(x+3)(x^2-3x+9) - (x+2)^2$ $\dot{i} x(x^2-3x+9) + 3(x^2-3x+9) - (x+2)(x+2)$ $\dot{i} x^3 - 3x^2 + 9x + 3x^2 - 9x + 27 - (x^2 + 4x + 4)$ $\dot{i} x^3 + 27 - x^2 - 4x - 4$ $\dot{i} x^3 - x^2 - 4x + 23$	✓ ✓ removing brackets ✓ simplification ✓ answer (4)
2.1.3	$\frac{3x^2-3}{x^2-5x-6} \div \frac{1-x}{x-6} = \frac{3(x-1)}{(x-6)(x+1)} \times \frac{x-6}{-(x-1)}$ $= -\frac{3}{x+1}$	✓ $3(x-1)$ ✓ $(x-6)(x+1)$ ✓ $-(x-1)$ ✓ answer (4)
2.1.4	$\frac{3^x - 3^{x-1}}{5 \cdot 3^x - 3^{x+1}} = \frac{3^x - 3^x \cdot 3^{-1}}{5 \cdot 3^x - 3^x \cdot 3^1}$ $= \frac{3^x \left(1 - \frac{1}{3}\right)}{3^x(5-3)}$ $= \frac{2}{3} \div 2$ $\frac{1}{3}$	✓ expanding both denominator and numerator ✓ factorising numerator ✓ factorising denominator ✓ answer (4)
2.2.1	$a^2 - 2a - ax + 2x = a(a-2) - x(a-2)$ $= (a-2)(a-x)$	✓ ✓ taking out common factors ✓ answer (3)
2.2.2	$3y^3 + 192 = 3(y^3 + 64)$ $= 3(y+3)(y^2 - 3y + 8)$	✓ taking out common factor ✓ factorising sum of two cubes (2)

Marking Memorandum

QUESTION 3

3.1.1	$(x+4)(x-3)=x(x-1)$ $x^2+x-12=x^2-x$ $2x=12$ $\therefore x=6$	✓ simplify LHS ✓ simplify RHS ✓ $2x=12$ ✓ answer (4)
3.1.2	$x^2-6x-7=0$ $(x-7)(x+1)=0$ $x-7=0$ or $x+1=0$ $\therefore x=7$ or $x=-1$	✓ factors ✓ both answers (2)
3.1.3	$4 \cdot 3^{x+1}=972$ $3^{x+1}=243$ $3^{x+1}=3^5$ $x+1=5$ $\therefore x=4$	✓ simplification ✓ 3^5 ✓ equating exponents ✓ answer (4)
3.2	$-8 \leq x-2 < 7$ $-8+2 \leq x < 7+2$ $-6 \leq x < 9$ 	✓ transposing -2 ✓ critical values ✓ notation ✓ graphical representation (4)
3.3	let number of 2 wheel toy motorcycles be x and number of 3 wheel motorcycles be y $x+y=80$ -----1 $2x+3y=181$ -----2 From equation 1 $x=80-y$ Substitute $x=80-y$ in equation 2 $2(80-y)+3y=181$ $160-2y+3y=181$ $\therefore y=181-160$ $=21$ $\therefore x=80-21$ $=59$ \therefore There are 59 2 wheel and 21 3 wheel toy motorcycles	✓ equation (1) ✓ equation (2) ✓ substitution ✓ y value ✓ x value (5)

Marking Memorandum

3.4	$V = \frac{1}{3} \pi r^2 h$ $3V = \pi r^2 h$ $\frac{3V}{\pi h} = r^2$ $\therefore r = \sqrt{\frac{3V}{\pi h}}$	<p>✓ simplification</p> <p>✓ simplification</p> <p>✓ answer</p> <p>(3)</p>
-----	--	--

QUESTION 4

4.1.1	<p>Pattern is linear, $T_n = dn + c$</p> <p>To solve for c, substitute $n=1$ and $T_1=7$ and $d=4$</p> $7 = 4(1) + c$ $\therefore c = 3$ $\therefore T_n = 4n + 3$	<p>✓ substitution</p> <p>✓ value of c</p> <p>✓ answer</p> <p>(3)</p>
4.1.2	$T_n = 4n + 3$ $T_{71} = 4(71) + 3$ $= 287$	<p>✓ substitution</p> <p>✓ answer</p> <p>(2)</p>
4.1.3	$T_n = 4n + 3$ $131 = 4n + 3$ $131 - 3 = 4n$ $128 = 4n$ $\therefore n = 32$	<p>✓ substitution</p> <p>✓ answer</p> <p>(2)</p>
4.2.1	$4x + 11; 5x + 14$	<p>✓✓ each term</p> <p>(2)</p>
4.2.2	<p>For $x; 2x; 3x; \dots$</p> $T_n = xn$ <p>For $2; 5; 8; \dots$</p> $T_n = 3n - 1$ $\therefore T_n = xn + 3n - 1$	<p>✓ $T_n = xn$</p> <p>✓ $T_n = 3n - 1$</p> <p>✓ $T_n = xn + 3n - 1$</p> <p>(3)</p>

QUESTION 5

<p>5. 1</p>	$g(x) = \frac{3}{x} + 1$ $0 = \frac{3}{x} + 1$ $-1 = \frac{3}{x}$ $-x = 3$ $\therefore x = -3$	<p>✓ simplification</p> <p>✓ answer</p> <p>(2)</p>										
<p>5. 2</p>		<table border="1" data-bbox="1173 678 1428 907"> <thead> <tr> <th>f</th> <th>g</th> </tr> </thead> <tbody> <tr> <td>✓ y-int</td> <td>✓ x-int</td> </tr> <tr> <td>✓ assy m</td> <td>✓ assy m</td> </tr> <tr> <td>✓ shape</td> <td>✓ shape</td> </tr> <tr> <td></td> <td></td> </tr> </tbody> </table> <p>(6)</p>	f	g	✓ y-int	✓ x-int	✓ assy m	✓ assy m	✓ shape	✓ shape		
f	g											
✓ y-int	✓ x-int											
✓ assy m	✓ assy m											
✓ shape	✓ shape											
<p>5. 3</p>	<p>Range: $y > 0$</p>	<p>✓ answer</p> <p>(1)</p>										
<p>5. 4</p>	$p(x) = \frac{3}{x} + 1 + 2$ $\therefore p(x) = \frac{3}{x} + 3$	<p>✓ ✓ answer</p> <p>(2)</p>										
<p>5. 5</p>	<p>$x = 0$ $y = 3$</p>	<p>✓ answer ✓ answer</p> <p>(2)</p>										