



Education and Sport Development

Department of Education and Sport Development
Departement van Onderwys en Sport Ontwikkeling
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NORTH WEST PROVINCE

GRADE 10

MATHEMATICS PAPER 1

MID YEAR EXAMINATION MEMORANDUM 2018

MARKS: 75

This memorandum consists of 6 pages



Demo

NW/JUNE/MATH/EMIS/6*****

QUESTION 1[10]

1.1	$0,4\dot{3}$ and $\sqrt[3]{-\frac{1}{27}}$	$\checkmark 0,4\dot{3}$ $\checkmark \sqrt[3]{-\frac{1}{27}}$ (2)
1.2	9,87	\checkmark answer (1)
1.3	$0,4\dot{3} = 0,4333333333..$ let $x = 0,4\dot{3}$ $\therefore 10x = 4,3 \text{ ----- (1)}$ $\therefore 100x = 43,3 \text{ ----- (2)}$ equation (2) - (1) $90x = 39$ $\therefore x = \frac{13}{30}$	\checkmark equation 1 \checkmark equation 2 $\checkmark 90x = 39$ \checkmark answer (4)
1.4	$7\sqrt{2} = \sqrt{98}$ $\sqrt{81} < \sqrt{98} < \sqrt{100}$ $9 < \sqrt{98} < 10$ \therefore it lies between integers 9 and 10	$\checkmark 7\sqrt{2} = \sqrt{98}$ $\checkmark \sqrt{81} < \sqrt{98} < \sqrt{100}$ \checkmark answer (3)

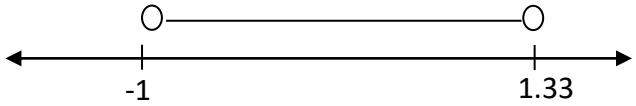
QUESTION 2[16]

2.1	$(2a - 3b)(3a^2 + 2ab - 3b^2)$ $= 2a(3a^2 + 2ab - 3b^2) - 3b(3a^2 + 2ab - 3b^2)$ $= 6a^3 + 4a^2b - 6ab^2 - 9a^2b - 6ab^2 + 9b^3$ $= 6a^3 - 5a^2b - 12ab^2 + 9b^3$	$\checkmark 6a^3 + 4a^2b - 6ab^2$ $\checkmark -9a^2b - 6ab^2 + 9b^3$ \checkmark answer (3)
2.2.1	$3x + 6y - ax - 2ay = 3(x + 2y) - a(x + 2y)$ $= (x + 2y)(3 - a)$	\checkmark common factor \checkmark answer (2)
2.2.2	$3x^2 + 17x - 6 = (3x - 1)(x + 6)$	$\checkmark (3x - 1)$ $\checkmark (x + 6)$ (2)

2.3.1	$\frac{2^{3n+2} \cdot 8^{n-3}}{4^{3n-2}} = \frac{2^{3n} 2^2 \cdot 2^{3(n-3)}}{2^{2(3n-2)}}$ $= \frac{2^{3n} 2^2 \cdot 2^{3n-9}}{2^{6n-4}}$ $= 2^{3n+3n-6n} \cdot 2^{-9+4}$ $= 2^0 \cdot 2^{-3}$ $= 1 \times \frac{1}{8}$ $= \frac{1}{8}$	<ul style="list-style-type: none"> ✓ simplify numerator ✓ simplify denominator ✓ simplification ✓ 2^{-3} ✓ answer <p style="text-align: right;">(5)</p>
2.3.2	$\frac{p^3 + q^3}{6p^2} \times \frac{3p - 3q}{p^2 - q^2} = \frac{(p+q)(p^2 - pq + q^2)}{6p^2} \times \frac{3(p-q)}{(p+q)(p-q)}$ $= \frac{p^2 - pq + q^2}{2p^2}$	<ul style="list-style-type: none"> ✓ factor sum of two cubes ✓ common factor ✓ factor diff. of two squares ✓ answer <p style="text-align: right;">(4)</p>

QUESTION 3[22]

3.1.1	$3x - 5 = 2(3x - 1)$ $3x - 5 = 6x - 2$ $3x - 6x = -2 + 5$ $-3x = 3$ $\therefore x = -1$	<ul style="list-style-type: none"> ✓ removing brackets ✓ simplify ✓ answer <p style="text-align: right;">(3)</p>
3.1.2	$x(x - 2) = 8$ $x^2 - 2x = 8$ $x^2 - 2x - 8 = 0$ $(x - 4)(x + 2) = 0$ $\therefore x = 4 \text{ or } x = -2$	<ul style="list-style-type: none"> ✓ removing brackets ✓ standard form ✓ factors ✓ both answers <p style="text-align: right;">(4)</p>
3.1.3	$3^{2x+2} = \frac{1}{27}$ $3^{2x+2} = \frac{1}{3^3}$ $3^{2x+2} = 3^{-3}$ $\therefore 2x + 2 = -3$ $2x = -5$ $\therefore x = -\frac{5}{2}$	<ul style="list-style-type: none"> ✓ 3^{-3} ✓ equating exponents ✓ simplification ✓ answer <p style="text-align: right;">(4)</p>

3.2	$-\frac{1}{3} < \frac{x-1}{6} < \frac{1}{18}$ $-2 < x-1 < \frac{1}{3}$ $-2+1 < x < \frac{1}{3}+1$ $-1 < x < \frac{4}{3}$ 	✓ simplification ✓ critical values ✓ notation ✓ graphical representation (4)
3.3.1	let price of fruit yoghurt be x and of plain yoghurt be y $x = y + 4$ $5x + 3y = 84$	✓✓ each equation (2)
3.3.2	let fruit yoghurt be x and plain yoghurt be y $x = y + 4$ $5x + 3y = 84$ substitute $5(y + 4) + 3y = 84$ $5y + 20 + 3y = 84$ $8y = 64$ $\therefore y = 8$ $x = 8 + 4$ $= 12$ \therefore each fruit yoghurt cost R12 and each plain yoghurt cost R8	✓ substitution ✓ removing brackets ✓ simplification ✓ $y = 8$ ✓ $x = 12$ (5)

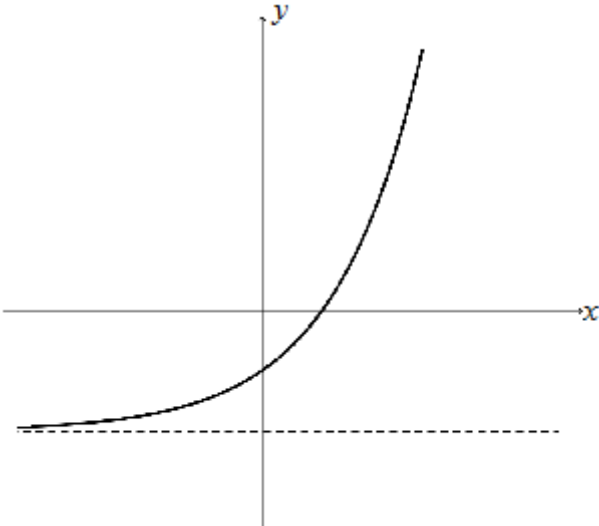
QUESTION 4[9]

4.1.1	$4 \quad \backslash \quad / \quad 7 \quad \backslash \quad / \quad 10$ $3 \quad / \quad \backslash \quad 3 \quad / \quad \backslash$ next terms 13 \therefore the fourth diagram will have 13 blocks	✓ pattern ✓ answer Answer only: full marks (2)
4.1.2	Pattern is linear, $T_n = dn + c$ To solve for c , substitute $n = 1$ and $T_1 = 4$ $4 = 3(1) + c$ $\therefore c = 1$ $\therefore T_n = 3n + 1$	✓ substitution ✓ value of c ✓ answer (3)

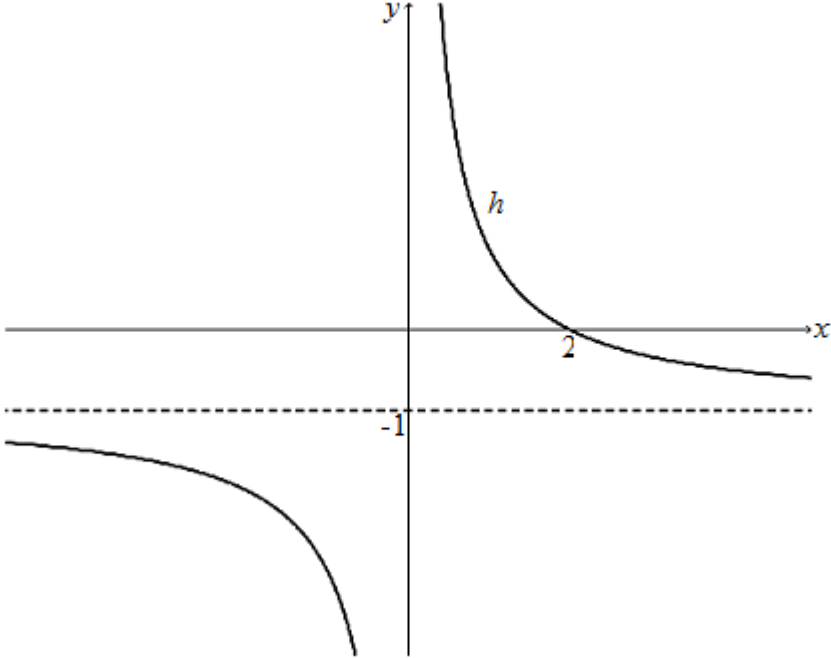
4.1.3	$T_n = 3n + 1$ $70 = 3n + 1$ $3n = 69$ $\therefore n = 23$ The 23 rd diagram will have 70 blocks	✓ substitution ✓ answer (2)
4.2	$88888888 = 987654 \times 9 + 2$	✓ 987654 ✓ +2 (2)

QUESTION 5[12]

5.1.1	C is y - intercept of $f, x = 0$ $\therefore y = -0^2 + 9$ $= 9$ $\therefore C(0;9)$ E is y - intercept of g $\therefore y = 0 - 3 = -3$ $\therefore E(0;-3)$	✓ subst. $x = 0$ ✓ C(0;9) ✓ E(0;-3) (3)
5.1.2	$CE = CO + OE$ $= 9 + 3 = 12$ units	✓ method ✓ answer (2)
5.1.3	A is point of intersection $\therefore f(x) = g(x)$ $-x^2 + 9 = x - 3$ $x^2 + x - 12 = 0$ $(x + 4)(x - 3) = 0$ $x = -4$ or $x = 3$ $\therefore x = -4$ $y = -4 - 3 = -7$ $\therefore A(-4;-7)$	✓ equating ✓ standard form ✓✓ each coordinate (4)

<p>5.2</p>		<ul style="list-style-type: none"> ✓ shape ✓ increasing function ✓ asymptote below $x - axis$ <p style="text-align: right;">(3)</p>
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QUESTION 6[6]

<p>6.1</p>	$h(x) = \frac{2}{x} - 1$ <p>$x - intercept, y = 0$</p> $0 = \frac{2}{x} - 1$ $1 = \frac{2}{x}$ $\therefore x = 2$	<ul style="list-style-type: none"> ✓ subst. $y = 0$ ✓ $x = 2$ <p style="text-align: right;">(2)</p>
<p>6.2</p>	<p>$y = -1$</p>	<ul style="list-style-type: none"> ✓ answer <p style="text-align: right;">(1)</p>
<p>6.3</p>		<ul style="list-style-type: none"> ✓ $x - intercept$ ✓ asymptotes ✓ shape <p style="text-align: right;">(3)</p>