



education

Department:
Education
REPUBLIC OF SOUTH AFRICA

**NATIONAL
SENIOR CERTIFICATE**


GRADE 10

MATHEMATICS P1

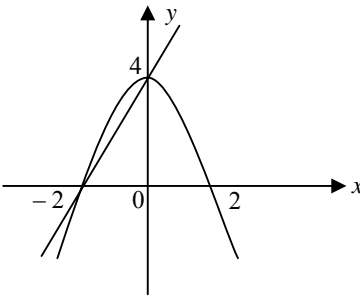
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This memorandum consists of 6 pages.

<p>1.1.1</p> $(3x - 2)(x^2 + 1) - 2$ $= 3x^3 - 2x^2 + 3x - 2 - 2$ $= 3x^3 - 2x^2 + 3x - 4$ <p style="text-align: right;">(3)</p>	<p>√√ Removing brackets/Simplification √ Grouping of like terms</p>
<p>1.1.2</p> $\frac{(2^2 \times 3)^{x+1}}{2^{2x} \times 3^x}$ $= \frac{2^{2x+2} \times 3^{x+1}}{2^{2x} \times 3^x}$ $= 2^{2x+2-2x} \times 3^{x+1-x}$ $= 2^2 \times 3^1$ $= 12$ <p style="text-align: right;">(4)</p>	<p>√ Application of exponent law √ Application of exponent law √ Simplification √ answer 4</p>
<p>1.1.3</p> $= \frac{(x-1)(x+1)}{3} \times \frac{1}{x-1} - \frac{1}{2}$ $= \frac{x+1}{3} - \frac{1}{2}$ $= \frac{2x+2-3}{6}$ $= \frac{2x-1}{6}$ <p style="text-align: right;">(4)</p>	<p>√ factorising √ Cancelling √ simplification √ answer</p>
<p>1.2.</p> $(x+2)^2 = x^2 + 4x + 4$ $x^2 - x + 4 = x^2 - x + 4 + 5x$ <p>∴ Add 5x</p> <p style="text-align: right;">(3)</p>	<p>√ Expansion √ Equivalent expression √ 5x</p>
<p>1.3</p> $2000 = 2 \times M^3 \times N^3$ $1000 = (M \times N)^3$ $10^3 = (M \times N)^3$ $10 = M \times N$ <p style="text-align: right;">(3)</p>	<p>√ dividing both sides by 2 √ writing as a cube √ answer 10</p>
<p>1.4</p>	

1.4.1 $3x^2 - 5x - 2$ $(3x + 1)(x - 2)$ (2)	$\sqrt{\sqrt{\quad}}$ One for each factor.
1.4.2 $n^2 + 3n - 5n - 15$ $= n(n + 3) - 5(n + 3)$ $= (n + 3)(n - 5)$ (3)	$\sqrt{\quad}$ removal of common factor $\sqrt{\sqrt{\quad}}$ One for each factor
1.5 $\sqrt{4} = 2$; $\sqrt{\frac{25}{9}} = \frac{5}{3}$; $\sqrt{9} = 3$ (3)	$\sqrt{\sqrt{\quad}}$ $\sqrt{\quad}$ One for each answer (Any mathematically correct answer)
<u>QUESTION TWO</u>	
2.1.1 $2x(x - 1) = 4$ $x(x - 1) = 2$ $x^2 - x - 2 = 0$ $(x + 1)(x - 2) = 0$ $\therefore x = -1$ or $x = 2$ (4)	$\sqrt{\quad}$ Dividing by 2 $\sqrt{\quad}$ standard form $\sqrt{\quad}$ factoring trinomial $\sqrt{\quad}$ both answers
2.1.2 By trial and error $3^2 = 9$ $3^3 = 27$ $3^4 = 81$ Therefore x is between 3 and 4 By trial and error answer is $x = 3.9$ (3)	$\sqrt{\quad}$ Calculating powers $\sqrt{\quad}$ Estimation, between values $\sqrt{\quad}$ Estimation of value
2.2 $-2 \leq x - 1 < 3$ $-1 \leq x < 4$  (4)	$\sqrt{\quad}$ $\sqrt{\quad}$ solving for x $\sqrt{\quad}$ $\sqrt{\quad}$ Number line representation

QUESTION 3		
3.1.1	$8 \times 2 = 16 \quad (2^4)$ (1)	✓ answer
3.1.2	$16 \times 2 = 32 \quad (2^5)$ (1)	✓ answer
3.1.3	The number of letters sent will always be a power of 2. The power is always 1 less than the stage.	✓ ✓ Any acceptable explanation .
3.1.4	nth stage = 2^{n-1} . (2)	✓✓
3.2	Let cost of Chocolate be x Let cost of Chips be y Then $2x + 4y = 32$(1) $3x + 8y = 58$(2) Now (1) $\times 2$: $4x + 8y = 64$ (3) (3) – (2) $x = 6$ Substituting $x = 6$ in (1) we have $2(6) + 4y = 32$ $4y = 20$ $y = 5$ \therefore Cost of Chocolate = R6 and Cost of Chips = R5 (6)	✓ Equation (1) ✓ Equation (2) ✓ Equation (3) ✓ $x = R6$ ✓ Substitution for x ✓ Cost of Chips, y
QUESTION 4		
4.1	Simple Interest = $\frac{Pr t}{100}$ $\frac{2750 \times 8.5 \times 4}{100} = 935$ \therefore Zaida receives $R2750 + R935 = R3685$ (4)	✓ Correct Formula ✓ Correct substitution ✓ SI ✓ Answer
4.2	$A = P\left(1 + \frac{r}{100}\right)^n$ $= 12500(1,055)^5$ $= 16337 \text{ people}$ (5)	✓ Correct formula ✓ ✓ ✓ Substitution in formula ✓ Correct answer
4.3.1	Total need in rands is $3 \times R17\,000 = R51\,000$ \therefore Amount needed in Nigerian currency is $\frac{51000}{18.85} = 2705.57 \text{ Naira}$ (3)	✓ Rand value R51 000 ✓ ✓ Correct conversion
QUESTION 5		

<p>5.1.1 Graph (6)</p>  <p>5.1.2 $x < -2$ or $x > 0$ (3)</p> <p>5.1.3 $p(x) = x^2 - 4$ (2)</p> <p>5.2.1 A(-1 ; 3) ; B(0 ; 1) (2)</p> <p>5.2.2 $x \in \mathbb{R}$ (1)</p> <p>5.2.3 $y = 3^x$ (2)</p> <p>5.2.3 $y = 2$ (2)</p>	<p>√ Shape – parabola √√ x-intercepts √ y - intercept √ shape straight line √ x or y intercept</p> <p>√√ for each critical value (“or”) √ inequality signs √√ equation</p> <p>√√ 1 for each</p> <p>√</p> <p>√√ equation.</p> <p>√√ correct equation</p>
<p>QUESTION 6</p>	
<p>6.1 $a = -2$</p> <p>6.2 $h(x) = \tan x + 2$</p> <p>6.3 $x = 0^\circ$ or $x = 360^\circ$</p> <p>6.5 $x = 180^\circ$</p>	<p>√ $q = -2$</p> <p>√√ I mark for each term</p> <p>√√ I mark for each value √ correct answer</p> <p>√√ 1 mark for each answer √ correct x value</p>

QUESTION 7	
7.1 Maximum – about 0.4 Kw Minimum – about 3 Kw	√ √
7.2 Increasing – between 04:00 and 10:00 between 10:00 and 18:00 Decreasing – between 07:30 and 10:00 between 20:00 and 24:00	These are estimations in terms of the graph – allow slight discrepancies 1 mark for each period
7.3 Between 16:00 and 18:00	√√
7.4 $\text{Ave. rate} = \frac{1.5 - 0.5}{24}$ $= 0.04 \text{ Kw}$	√ √√
7.5 No – Acceptible motivation in terms of given data	√ No √√ Motivation