TEACHERS WITHOUT BORDERS PROGRAMME

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With grateful thanks to our associate partners, The National Department of Basic Education, The Independent Examinations Board, Siyavula Education, Smarticks, Noteshare, Lemonlicious, datacentrix, and most of all, to the schools and teachers from both the public and private education sectors who as founder contributors, have lent content to the Teachers without Borders programme, for the benefit of all South Africa's learners.

In Bill Gates words, at the Mandela Day 'Living Together' address: "Maintaining the quality of this country's higher education system while expanding access to more students will not be easy. But it's critical to South Africa's future" – working together, we can help achieve this."

Contributing schools to date:

Clifton School	Milnerton High	Rustenburg Girls' High	St Peter's
Durban Girls'	Northwood High	St Anne's DC	St Stithians
Fairmont High	Roedean	St John's DSG	Wynberg Boys' High
Herzlia High	Rondebosch Boys'	St Mary's DSG Kloof	Wynberg Secondary

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Q4 + Q5 + Q12 (25 marks)

Michele

Gr 10 Paper 1 November Examination

Question 1:

1. $(2x+1)(3x-4)-2x$
$= 6x^2 - 8x + 3x - 4 - 2x$
$= 6x^2 - 7x - 4$ ✓ (2)

Question 2:

2.1. $15x^4 - 15y^4$
$= 15(x^4 - y^4)$
$= 15(x^2 - y^2)(x^2 + y^2)$
$= 15(x-y)(x+y)(x^2+y^2)$ (3)

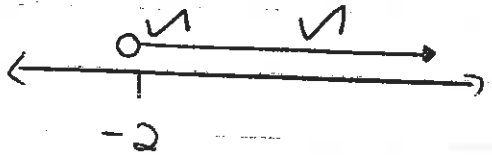
2.2 $2(x-y)^2 - x + y$
$2(x-y)^2 - (x-y)$
$(x-y)(2(x-y)-1)$
$(x-y)(2x-2y-1)$ (2)

Question 3:

3.1 $2x^2 - 7x + 3 = 0$
$(2x - 1)(x - 3) = 0$
$2x - 1 = 0$ or $x - 3 = 0$
$2x = 1$ or $x = 3$ ✓ (3)
$x = 1/2$ ✓

3.2) $bx^2 - kx = 0$
$x(bx - k) = 0$
$x = 0$ ✓ or $bx - k = 0$
$bx = k$
$x = k/b$ ✓ (3)

3.3) $7(3x+2) - 5(2x-3) > 7$
$21x + 14 - 10x + 15 - 7 > 0$
$11x + 22 > 0$ ✓
$11x > -22$
$x > -22/11$
$x > -2$ ✓ (3)



Question 4:

4.1) $T_n = 2n^2 + 1$
$T_4 = 2(4)^2 + 1$
$T_4 = 33$ ✓ (1)

4.2) 1, 3, 4, 7, 11 (4+7), 18 (7+11), ... (1)

4.3) $\frac{1}{2n}$ ✓ ✓ (2)

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1.4)

4.1.1) Pattern 1 = 5 — 5
Pattern 2 = 9 — 5+4
Pattern 3 = 13 — 5+2×4
Pattern 4 = 17 — 5+3×4
Pattern 5 = 21 — 5+4×4 (2)

4.1.2) There are 5 squares in the first pattern and 4 more for each consecutive pattern (2)

4.1.3) $T_n = 4n + 1$ (2)

4.1.4 $T_{15} = 4(15) + 1$
$T_{15} = 61$ (2)

Question 5:

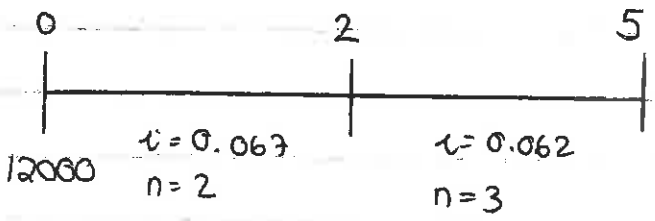
5.1) Deposit = R3999.00 × 12/100
= R479.88
Balance = R3519.12

$A = P(1 + in)$
$A = 3519.12(1 + 3(0.221))$
$A = R\,5852.30$

Amount per month: $\frac{R5852.30 + R9.60}{36}$
= R172.16 (5)

5.2) Total Amount =
R479.88 + R5852.30 + R345.60 (9.60 × 36)
= R6677.78 (1)

Question 6:



$A = 12\,000(1.067)^2(1.062)^3$
A = R16363.78 (4)

Question 7:

7.1) See Appendix 1 (8) (Cartagram Sheet)

7.2) 20/350 = 2/35 (1)
7.3) 316/350 = 158/175 (1)
7.4) 74/350 = 37/175 (1)
7.5) 110/350 = 11/35 (1)
7.6) 14/350 = 7/175 = 1/25 (1)

Question 8:

8.1) $q = 2$ (2)
8.2) $q = -1$ (2)
8.3) $q = 1$ (2)

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SECTION B

Question 9:

9.1) $3.2^{x+1} - 192 = 0$

$2^{x+1} = 64$ ✓

$2^{x+1} = 2^6$ ✓

$x+1 = 6$ ✓

$x = 5$ ✓ (4)

9.2) $\frac{a}{x} = \frac{b}{x} + ac - bc$ ✓

$a = b + acx - bcx$ ✓

$a - b = acx - bcx$

$a - b = x(ac - bc)$ ✓

$\frac{a-b}{ac-bc} = x$ ✓

$x = \frac{a-b}{c(a-b)}$ ✓ (4)

$x = 1/c$

$\frac{3^{2x}(4 - 9.3^{-2})}{3^{2x}(1 - 3^{-1})}$ ✓ ✓ ✓ ✓ ✓

$= (4 - 9/9) \div (1 - 1/3)$ ✓

$= (4-1) \div (2/3)$

$= 3 \times \frac{3}{2}$ (5)

$= \frac{9}{4}$ ✓

$\angle CO = x$

Question 10:

$\frac{4.3^{2x} - 9.3^{2x-2}}{3^{2x} - 3^{2x-1}}$

$= \frac{4.3^{2x} - 9.3^{2x}.3^{-2}}{3^{2x} - 3^{2x}.3^{-1}}$

Question 11:

$F(x) = x^2 - 1 \quad g(x) = x + 1$

11.1) x int ($y = 0$)

$x^2 - 1 = 0$ ✓

$(x-1)(x+1) = 0$ (3)

$x = 1$ or $x = -1$

$A(-1, 0)$ and $B(1, 0)$

11.2) y int ($x = 0$)

$y = 0 + 1 = 1$ ✓

$\therefore OC = 1$ unit ✓ (2)

11.3) $y = x^2 - 1$ ... ①

$y = x + 1$ ... ②

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$x^2 - 1 = x + 1$ ✓

$x^2 - x - 2 = 0$

$(x-2)(x+1) = 0$ ✓

$x = 2$ or $x = -1$ (4)

$x_0 = 2$ ✓

sub $x = 2$ into $y = x + 1$

$y = 2 + 1 \quad y = 3$

$\therefore$ O(2,3) ✓

11.4. y int ($x = 0$)

$y = x^2 - 1$ ✓

$y = -1$

$(0, -1)$ $\therefore$ OE = 1 unit (2)

11.5. $FG = y_F - y_G$

$FG = x^2 - 1 - (x+1)$ ✓

$FG = x^2 - 1 - x - 1$

$FG = x^2 - x - 2$ ✓

CH = 4 units $\therefore$ $x = 4$ ✓

$FG = (4)^2 - (4) - 2$

$FG = 16 - 4 - 2$ (4)

FG = 10 units ✓

11.6. $IJ = y_I - y_J$

$4 = x^2 - 1 - (x+1)$ ✓

$4 = x^2 - 1 - x - 1$

$0 = x^2 - x - 6$ ✓

$0 = (x-3)(x+2)$ ✓

$x = 3$ or $x = -2$

$x_I = -2$ or $x_J = -2$

$x_I = -2 \quad y_I = x^2 - 1$

$y_I = (-2)^2 - 1$

$y_I = 4 - 1 = 3$

I = (−2, 3) ✓

$x_J = -2 \quad y_J = x + 1$

$y_J = -2 + 1$

$y_J = -1$

J = (−2, −1) ✓ (4)

11.7) $x < -1$ ✓ and / or $x > 1$ ✓ (2)

11.8) $y = x^2 - 1$

R: $-y = x^2 - 1$

T: $y = -x^2 + 1 + 2$ ✓ ✓ $y = -x^2 + 3$ (2)

Question 12:

12.1) $-199 - 200$ ✓ ✓

$= -399$ ✓ (2)

12.2

LHS: $x^2 - (x+1)^2$ ✓

$: x^2 - (x^2 + 2x + 1)$

$x^2 - x^2 - 2x - 1$

$-2x - 1$ ✓

RHS: $-x - (x+1)$ ✓ ✓

$-x - x - 1$

$-2x - 1$ (5)

$\therefore$ LHS = RHS

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Gr 10 November Examination Paper 1

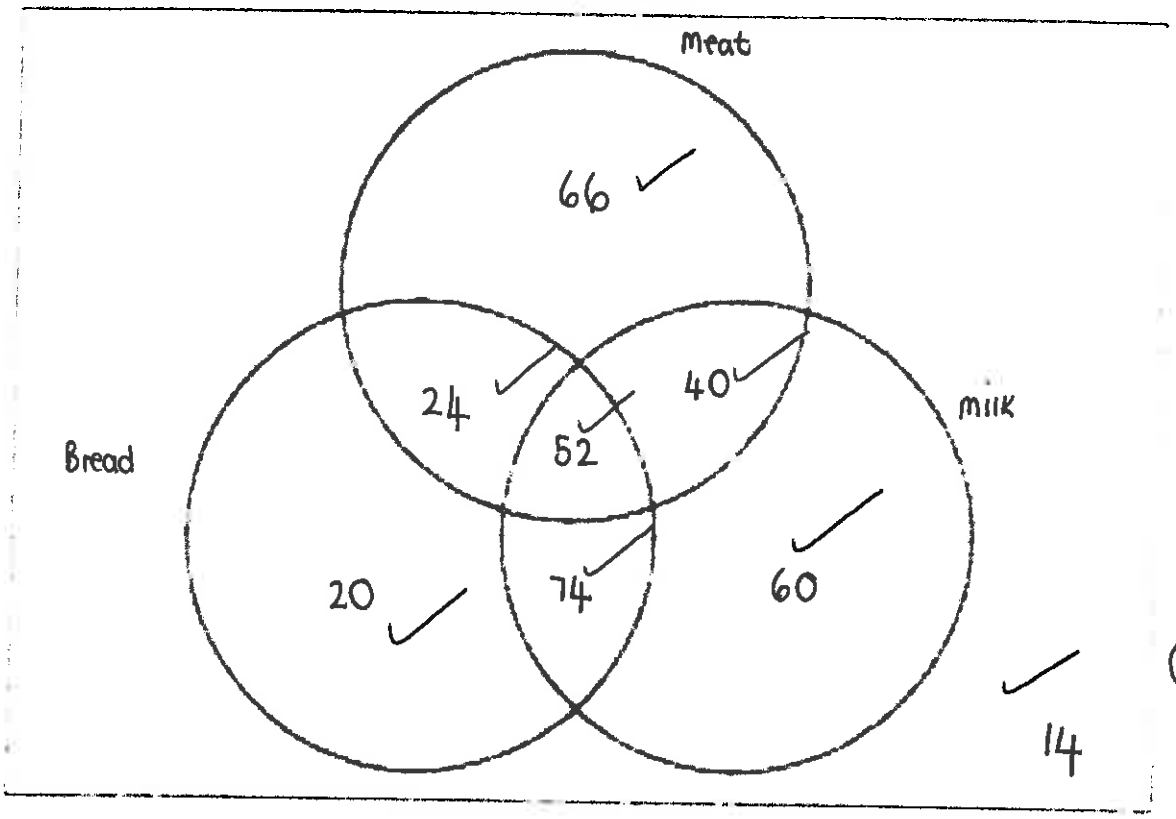
Diagram Sheet

Name: ME MO

Name of Maths Teacher: _____

Please answer on the diagram sheet and hand your paper in with your other answer sheets.

Question 7:



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