



eduresourceza.com

TEACHERS WITHOUT BORDERS PROGRAMME

BROUGHT TO YOU BY



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

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



JULY EXAMINATIONS 2016

MATHEMATICS PAPER I: GRADE 10

Date: 18 July 2016

Time: 2 hours

SESSION: 1

Marks: 100

Name of Student: _____

Name of Teacher:
(Please circle)

--	--	--	--	--

For Examiner's use only:

	SECTION A					SECTION B				
Question	1	2	3	4	5	6	7	8	9	Total
Cognitive Levels	1/2	1/2	1/2	2	1/2	3	3/4	3	4	
Actual Mark										
Possible Mark	7	14	8	8	13	19	8	13	10	100

Read the following instructions carefully:

1. This examination paper consists of **14** pages and **9** questions. Please check that your paper is complete.
2. Read the questions carefully. Take note of the mark allocation and the wording of the questions.
3. Answer **ALL** the questions on the question paper in the spaces provided. No loose sheets are allowed.
4. Only non-programmable, non-graphical calculators are permitted.
5. **ALL CALCULATIONS AND WORKING DETAILS MUST BE SHOWN.**
6. It is in your own interest to write legibly and to present your work neatly.
7. Unless otherwise stated, round off correct to **TWO** decimal places, where necessary.

SECTION A – 50 Marks**QUESTION 1****[7]**

1.1 Classify the following numbers as rational, irrational or non-real:

1.1.1 $\sqrt[3]{9}$	(1)
1.1.2 $\sqrt{9}$	(1)
1.1.3 $\sqrt{-9}$	(1)

1.2 Express $0.\overline{15}$ as a common fraction. (4)

QUESTION 2**[14]**

Simplify:

2.1 $(x - 1)(x^2 + 1)(x + 1)$ (3)	2.2 $\frac{2x^2 - 8}{2 - x}$ (3)

2.3 $\frac{x^2-1}{3} \times \frac{1}{x-1} - \frac{1}{2}$ (5)	2.4 $\frac{20^{n+1} \cdot 4^n}{16^{n-1} \cdot 5^n}$ (3)
--	---

QUESTION 3**[8]**

3.1 Solve the following equations:

3.1.1 $x(x-4) = 0$ (2)	3.1.2 $(x-4)(x+5) = 10$ (3)
--	---

--	--

3.1.3 $125^{y-2} = 25^{2y+1}$ (3)

QUESTION 4**[8]**

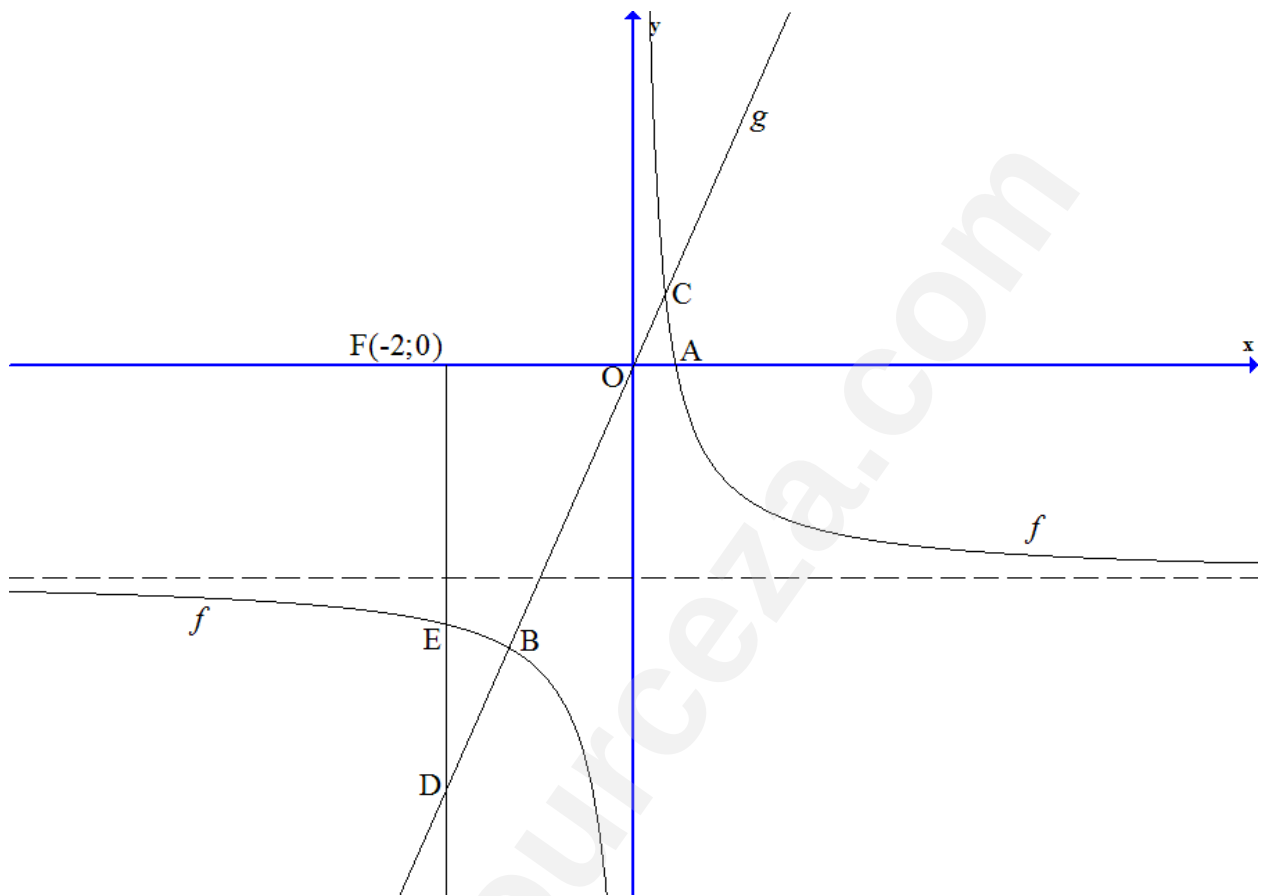
Factorise the following expressions:

4.1 $3x^5y^4 - 9x^2y^7$ (2)	4.2 $3 - 2x - x^2$ (2)
4.3 $xt - yt + ym - xm$ (4)	

eduresourceza.com

QUESTION 5**[13]**

The diagram below shows $f(x) = \frac{2}{x} - 6$ and $g(x) = 8x$.



5.1 Determine the coordinates of A, the x -intercept of f .

(2)

5.3 Give the domain of f . (2)

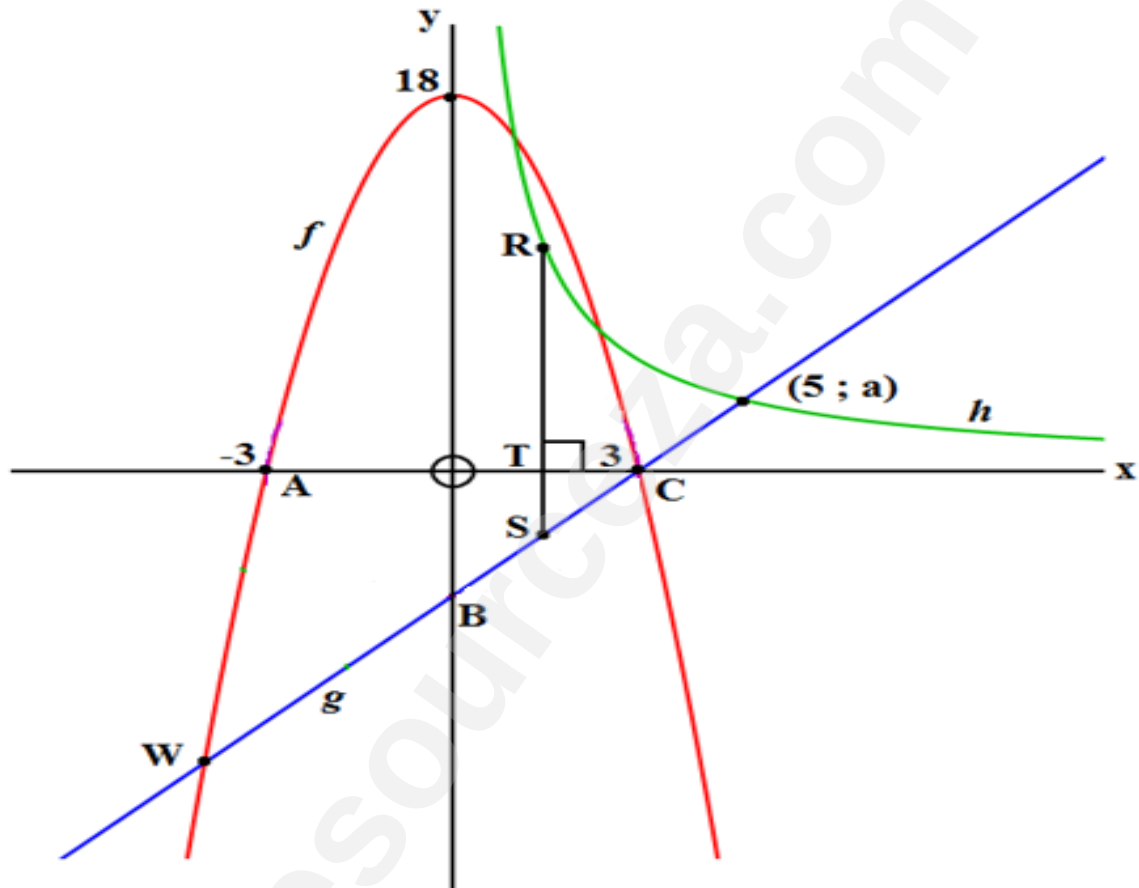
5.4 For which values of x is f increasing? (1)

5.5 Determine the coordinates of B and C, the points of intersection of f and g . (6)

SECTION B – 50 Marks**QUESTION 6****[19]**

Consider the functions of f , g and h below:

Given: $g(x) = x - 3$



6.1 Determine the equation of f .

(3)

6.2 Determine the co-ordinates of B .

(1)

6.3 Determine the equation of h .

(3)

6.4 Determine the length of RS if $OT = 1$.

(4)

6.5 If the equation of $f(x) = -2x^2 + 18$, determine the co-ordinates of W . (6)



6.6 Give the range of $f(x)$. (2)



QUESTION 7**[8]**

7.1 Factorise the expression $3x^2 - x - 2$.

(2)

7.2 Study the factorised versions of these expressions:

$$6x^2 - x - 5 = (6x + 5)(x - 1)$$

$$8x^2 - x - 7 = (8x + 7)(x - 1)$$

$$100x^2 - x - 99 = (100x + 99)(x - 1)$$

Now factorise the expression: $2010x^2 - x - 2009$.

(2)

7.3 Hence, factorise the expression: $kx^2 - x - (k - 1)$.

(4)

QUESTION 8**[13]**Solve for x :

$$8.1 \quad 2^{x+1} + 2^x = 12 \quad (4)$$

$$8.2 \quad \frac{3x}{5} \leq \frac{5x}{4} - 3\frac{1}{4} \quad (4)$$

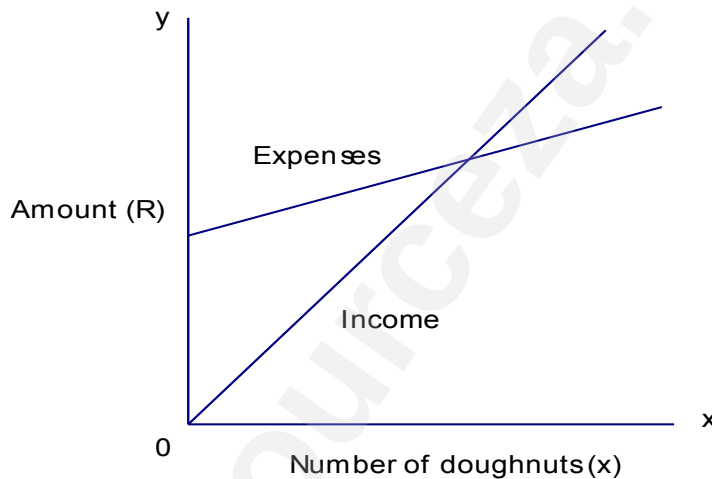
$$8.3 \quad m(x - m) = n(x - n) \quad (5)$$

QUESTION 9**[10]**

Simphiwe, a student at St Peter's College, has decided to sell doughnuts as part of the Grade 10 fundraising. She bought ingredients for which she had to pay R40. The cost of making the doughnuts amounted to R2 each. Simphiwe intends to sell the doughnuts at R4 each. She writes out the following equations for expenses and income:

Expense amount: $y = 2x + 40$

Income amount: $y = 4x$



Calculate:

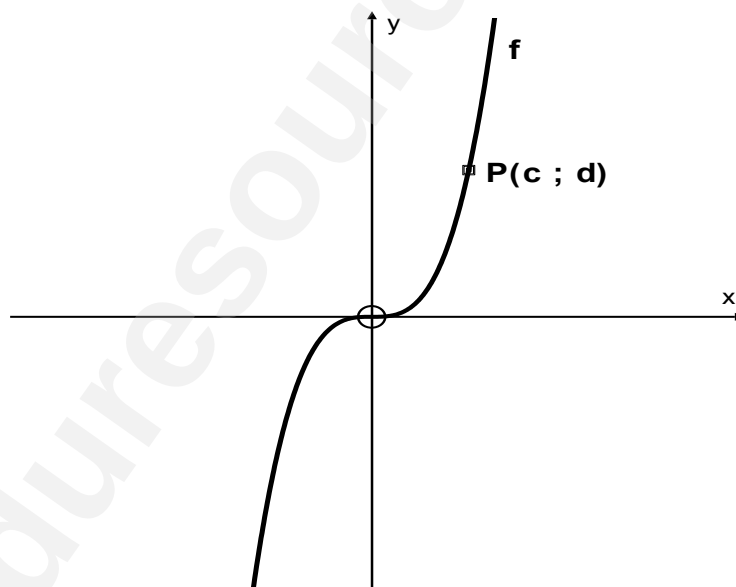
9.1.1 How many doughnuts must Simphiwe sell before her income exceeds her expenses?

(4)

9.1.2 Her profit after selling 30 doughnuts.

(2)

9.2 Sketched is $y = f(x)$ and $P(c; d)$.



Give the co-ordinates of **P** in terms of **c** and **d** if:

9.2.1 $y = f(x) + 2$

(2)

9.2.2 $y = 2f(x)$

(2)

eduresourceza.com