BERGVLIET HIGH SCHOOL

MATHEMATICS DEPARTMENT

NOVEMBER EXAMINATION

GRADE 11

MATHEMATICS PAPER 1

MARKS: 100 **TIME: 2 hours**

SET BY: Mrs Naysmith

This question paper consists of 6 pages – this includes 1 information sheet and 1 answer sheet.

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1. This question paper consists of 8 questions. Answer ALL the questions.
2. An answer sheet is provided for QUESTION 6.4 and QUESTION7.1.
3. Clearly show ALL calculations, diagrams, graphs, et cetera that you used to determine your answers.
4. Answers only will not necessarily be awarded full marks.
5. You may use an approved scientific calculator (non-programmable and non- graphical), unless stated otherwise.
6. If necessary, round off answers to TWO decimal places, unless stated otherwise.
7. Diagrams are NOT necessarily drawn to scale.
8. Write neatly and legibly.

QUESTION1

1.1 Solve for x

1.1.1 $2x^2-11x+15=0$ (2)

1.1.2 $3x^2-x-5=0$ (correct to 1 decimal place) (4)

1.1.3 $\sqrt{5-x}=x+1$ (4)

1.1.4 $x^2-x\geq 12$ (4)

1.2 Solve for x and y simultaneously: $3y+x=2$ and $y^2+x=xy+y$ (6)

1.3 Given: $A=9x^2+6x$

1.3.1 Write the equation in the form $A=a(x-p)^2+q$ (3)

1.3.2 Hence determine the minimum value of A. (1)

1.3.3 Give the value of x that will minimize A. (1)

1.4 Given $x=\sqrt{6+\sqrt{6+\sqrt{6+\sqrt{6+...}}}}$

1.4.1 Write x^2 in terms of x. (2)

1.4.2 Hence or otherwise determine the value of x. (2)

[29]

QUESTION 2

2.1 Simplify: $\dfrac{8^{1+2x}.16^{1-x}}{4^{x+1}}$ (4)

2.2 Solve for x

2.2.1 $3x^{\frac{1}{2}}-27=0$ (2)

2.2.2 $5^x+25^{x+1}=55$ (4)

[10]

QUESTION 3

The sequence -3 ; 3 ; x ; 27……. is a quadratic sequence.

3.1 Show that x is 13. (3)

3.2 Hence determine the n^{th} term of the sequence. (5)

3.3 Which term equals 157. Show all your working. (3)

[11]

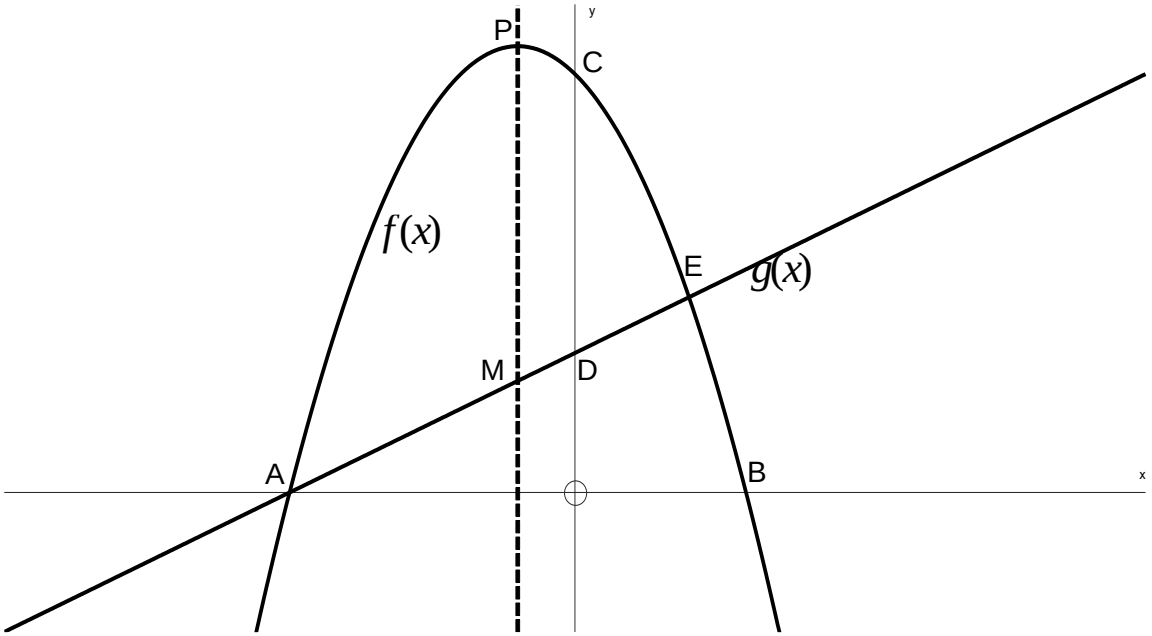
QUESTION 4

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[9]

QUESTION 5

The graphs of $f(x)=-2x^2-4x+30$ and $g(x)=2x+10$ are drawn below. A and B are the x intercepts and C is the y-intercept of $f(x)$. P is the turning point of $f(x)$.



5.1.	Determine the co-ordinates of A, B and C.	(4)
5.2	Determine the length of CD.	(1)
5.3	Determine the co-ordinates of P, the turning point of $f(x)$.	(3)
5.4	Find the equation $h(x)$ which is perpendicular to AE and passing through the origin.	(3)
5.5	Write down the values of x for which $f(x)>0$	(2)
5.6	Determine the length of PM if PM is parallel to the y-axis.	(2)
5.7	For which value of k will $f(x)-k$ have two negative real roots.	(2)

[17]

QUESTION 6

Consider the function: $h(x)=\frac{-6}{x-3}-1$

6.1 Write down the equation(s) of the asymptote(s) of h. (2)

6.2 Calculate the co-ordinates of the x-intercept. (2)

6.3 Sketch the graph on the ANSWER SHEET provided, clearly label all asymptote(s) and the intercepts with the axis. (4)

6.4 Write down the domain of h (2)

6.5 If $h(x)$ is shifted 4 units down and 3 units to the left to become $m(x)$, write down the new equation of $m(x)$. (2)

6.6 Determine the equation of the increasing axis of symmetry of $h(x)$. (2)

[14]

QUESTION 7

7.1 Sketch the graph of $f(x)=2^x-1$ on the ANSWER SHEET provided, clearly label all asymptote(s) and the intercepts with the axis. (3)

7.2 Write down the range of f. (2)

7.3 Determine the new equation $g(x)$ if $f(x)$ is reflected in the y-axis. (1)

[6]

QUESTION 8

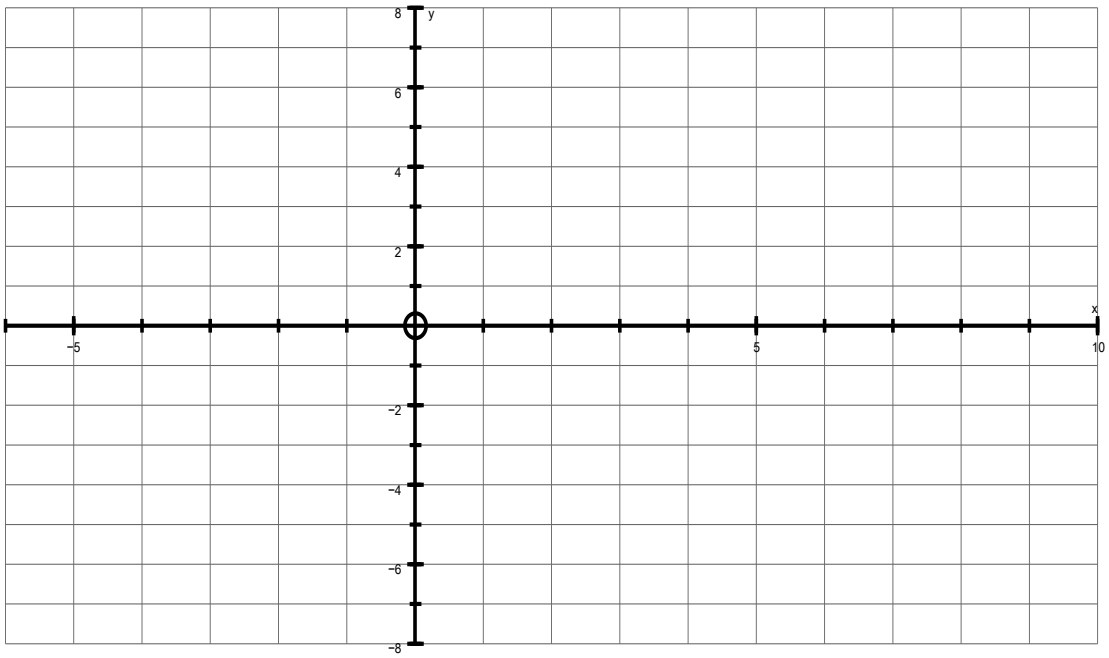
Give the equation of the quadratic function $f(x)$ in the form $y=ax^2+bx+c$ if

- The range of f is $y\geq -4$
- Domain is $x\in R$
- Passing through the points (3;0) and (-1; 0) [4]

GRADE 11 MATHS PAPER 1 ANSWER SHEET

MATHS TEACHER: Gr / Na / Or / Sm / Jo

6.3



7.1.

