Student Number_____

Teacher: VMA GHY TLE KST GLO JIO

Newington College

Year 11 Mathematics Advanced

2022 Assessment point 1

General Instructions

- Reading time: 5 minutes
- Working time: 80 Minutes
- Write using black or blue pen only. **Erasable ink is not allowed**
- Calculators approved by NESA may be used
- Attempt ALL questions, clearly showing ALL working out.
- A reference sheet is provided

Section I (20 Marks)

Section II (26 Marks)

Section III (14 Marks)

Results

Outcome / Section	Section I	Section II	Section III	Total
MA F1.1 Algebraic Techniques	**9**	**15**	**6**	**30**
MA F1.2 – 1.4 Working with Functions	**11**	**11**	**8**	**30**
Total	**20**	**26**	**14**	**60**

Section I

Student number_____

20 marks

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Attempt all questions

Write your answers in the space provided. Clearly showing all of your working.

Question 1

Simplify

(a) $\dfrac{4x+8}{x^2+2x}$ **2**

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(b) $\sqrt{x} \times 4\sqrt{x}$ **1**

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(c) $\dfrac{1}{2a} - \dfrac{3}{5a}$ **2**

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Section I continues over the page

Question 2

Simplify $\dfrac{2\sqrt{50}}{3\sqrt{10}}$ **2**

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Question 3

Solve $10k^2 + 5k = 0$ **2**

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Question 4

Given that $h(x) = \sqrt{x+4}$,

(a) find the value of $h(12)$ **1**

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(b) find the value of m if $h(m) = 12$ **2**

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Section I continues over the page

Question 5

Find the domain and range of $f(x) = \sqrt{9 - x^2}$. Express in interval notation. **2**

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Question 6

Classify the relation $x = -2$ as either : **1**

One-to-one, many-to-one, one-to-many or many-to-many.

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Question 7

Show by calculation that $f(x) = x^3 + \frac{4}{x}$ is an odd function. **3**

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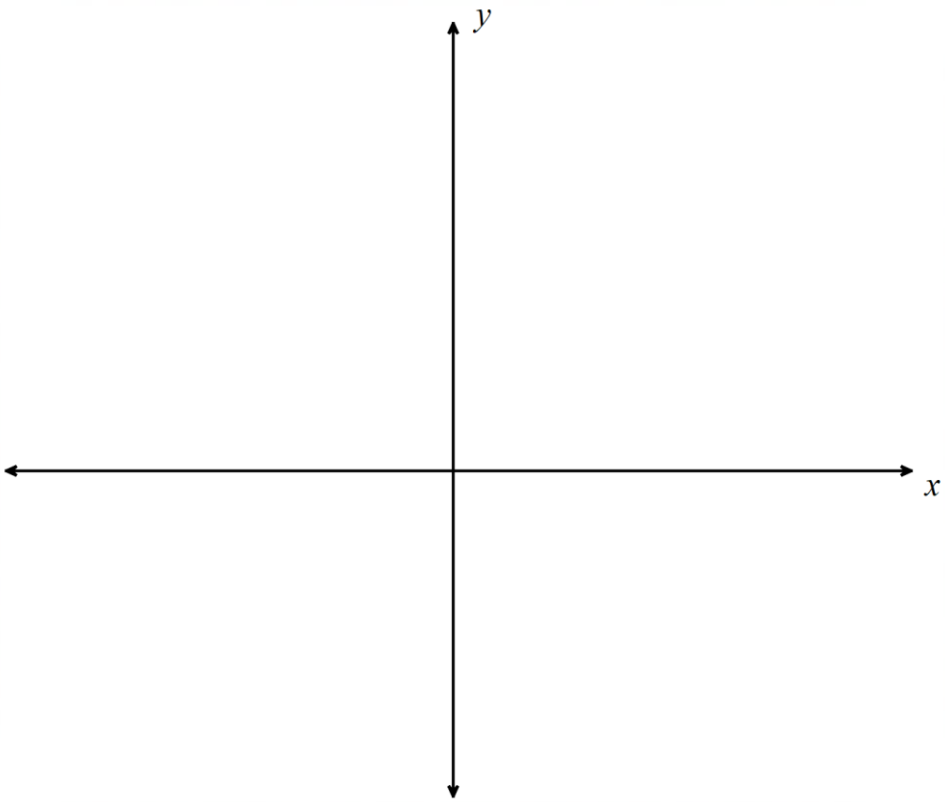
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Question 8

Sketch $y = 25 - x^2$, showing all intercepts. **2**



END OF SECTION I

Section II

Student number_____

26 marks

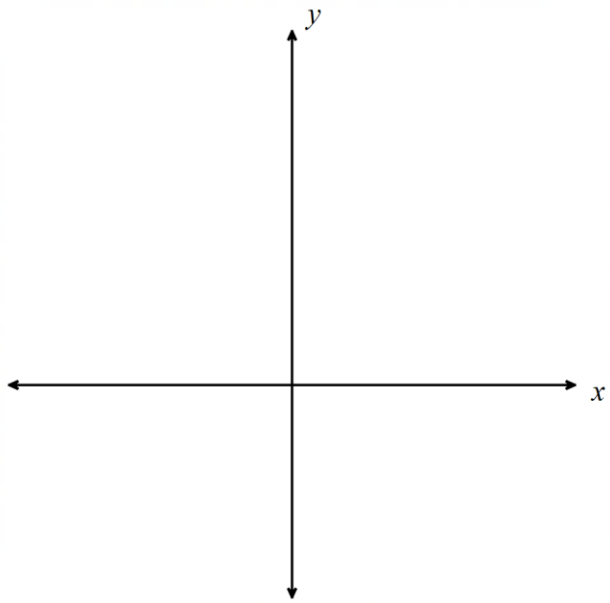
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Attempt all questions

Write your answers in the space provided. Clearly showing all of your working.

Question 1

(a) Sketch $y = |1 - 6x|$ and $y = 2x$ on the axis provided. Show all intercepts. **3**



(b) How many solutions does the equation $|1 - 6x| = 2x$ have ? **1**

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Question 2

Simplify $\dfrac{3x-3}{2x} \times \dfrac{x^2}{x-1}$ **3**

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Section II continues over the page

Question 3

Given $f(x) = x - 5$ and $g(x) = \sqrt{x}$,

(a) Evaluate $f[g(9)]$ **2**

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(b) Find $g[f(x)]$ **1**

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(c) State the domain of $g[f(x)]$ **1**

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Question 4

Solve for x: $9^x = \frac{1}{27}$ **2**

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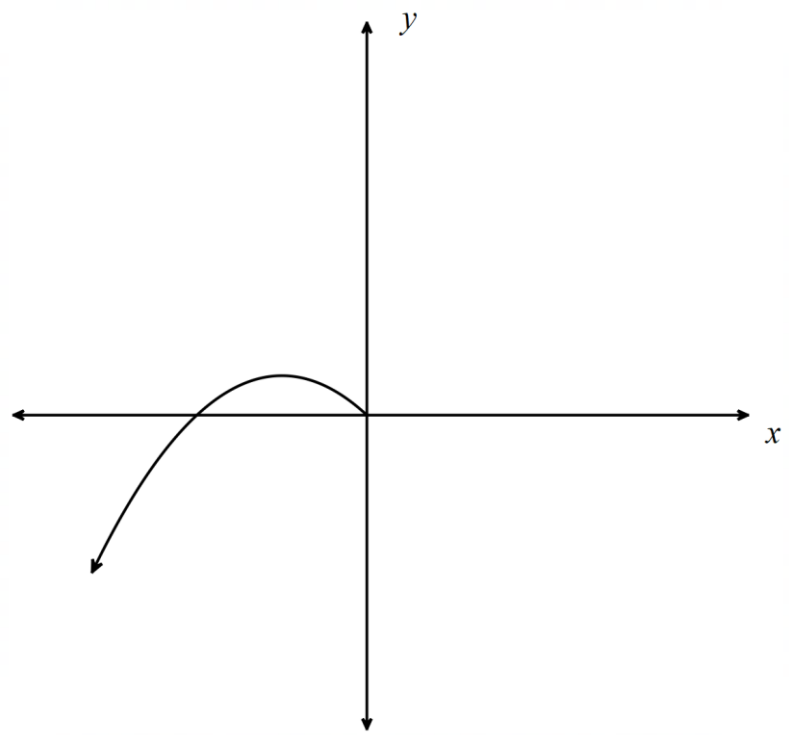
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Question 5

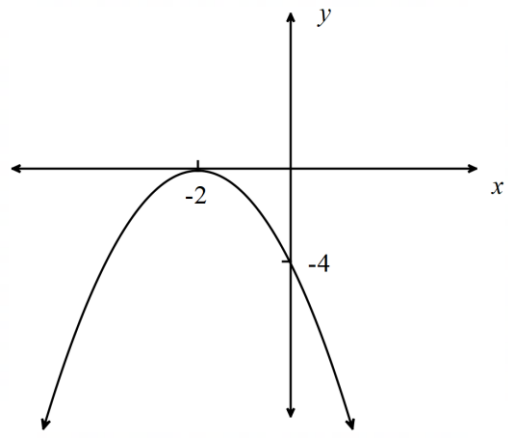
A part of the graph of $y = f(x)$ is shown below. **1**

Complete the rest of the graph given the function is odd.



Question 6

Give a possible equation for the parabola below. **2**



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Section II continues over the page

Question 7

Given $\dfrac{2\sqrt{5}-\sqrt{7}}{\sqrt{5}-\sqrt{7}} = m + n\sqrt{35}$, find the values of m and n. **3**

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Question 8

Solve $\dfrac{x}{3} - \dfrac{x-5}{4} = \dfrac{1}{2}$ **3**

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Section II continues over the page

Question 9

Find the equation of the straight line that is perpendicular to the line $5x - 3y + 1 = 0$, and also passes through the midpoint of the interval AB where A(-2,-3) and B(5,1). **4**

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END OF SECTION II

Section III

14 marks

Student number_____

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Attempt all questions

Write your answers in the space provided. Clearly showing all of your working.

Question 1

Given the function $f(x) = (x-2)^2 - 3$,

(a) find $f(-1)$ **1**

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(b) determine the range of the function in the domain $[-1, 3]$ **2**

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Question 2

Let $f(x) = 4 - \frac{1}{x}$. Find an expression for $f(x-5)$ as a single fraction. **3**

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Question 3

The sum of the squares of two consecutive positive integers is 25. Find the integers. **3**

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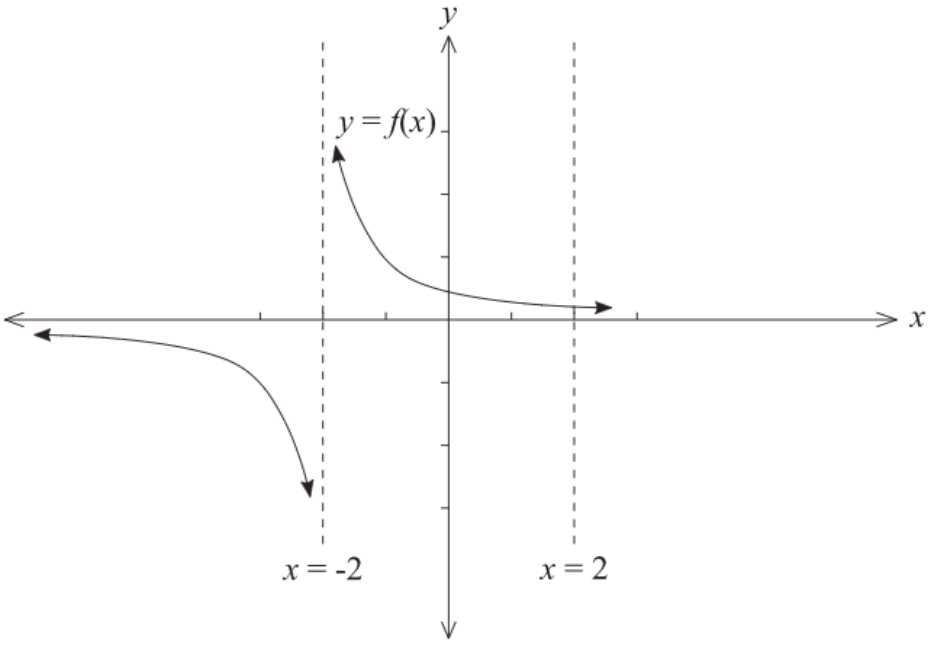
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Question 4

Consider the function $f(x) = \dfrac{1}{x+2}$. **2**



On the same graph above, sketch $y = f(-x)$.

Question 5

Solve the equation $2^{2x} - 2^{x} - 12 = 0$ given that $u = 2^{x}$. **3**

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END OF ASSESSMENT