Ms Davis **Mr Feng** **Name:** ……..……..
Mrs Greenberg **Mrs Kerr**
Ms Lau **Teacher:**…….

Pymble Ladies' College

MATHEMATICS EXTENSION 1

Year 11

ASSESSMENT TASK 1

Term 1

2020

Time Allowed: 40 minutes

General Instructions

- Working time is 40 minutes.
- In Section I circle the multiple choice answer for Questions 1 – 3.
- Write using black or blue pen. Black pen is preferred.
- Erasable pens are not to be used.
- Board approved calculators may be used.
- In Section II show relevant mathematical reasoning and/or calculations.
- A reference sheet is provided.

Total Marks 24

Highest Mark	**/24**
Your Mark	**/24**

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SECTION I
Multiple Choice (3 marks)

Circle the correct answer.

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1 If $f(x)=(3-x)(x+5)$, for which of the values of x is the graph of $y=f(x)$ below the x axis?

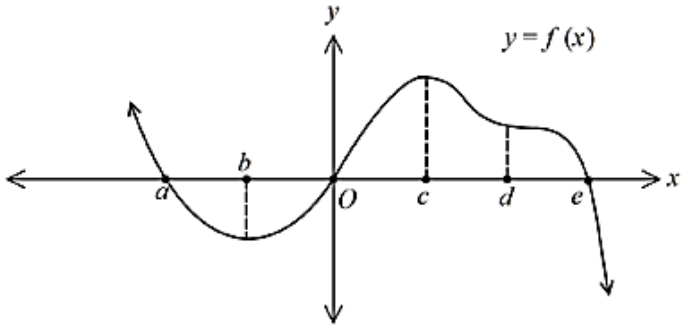
(A) $-5<x<3$

(B) $-3<x<5$

(C) $x<-3,\ x>5$

(D) $x<-5,\ x>3$

2 Which is the largest domain containing the origin for which $f(x)$ has an inverse function.



(A) $a \le x \le c$

(B) $b \le x \le c$

(C) $b \le x \le d$

(D) all values of x

3 Which of the following is the solution to $\frac{1}{x} \ge 1$?

(A) $x \le 1$

(B) $x \in (0,1]$

(C) $x \in [0,1)$

(D) $x<0$ or $x \ge 1$

SECTION II

21 Marks

Attempt all questions in the space provided.
All necessary working should be shown. **Marks**

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4 Solve $6 - x - x^2 < 0$ **2**

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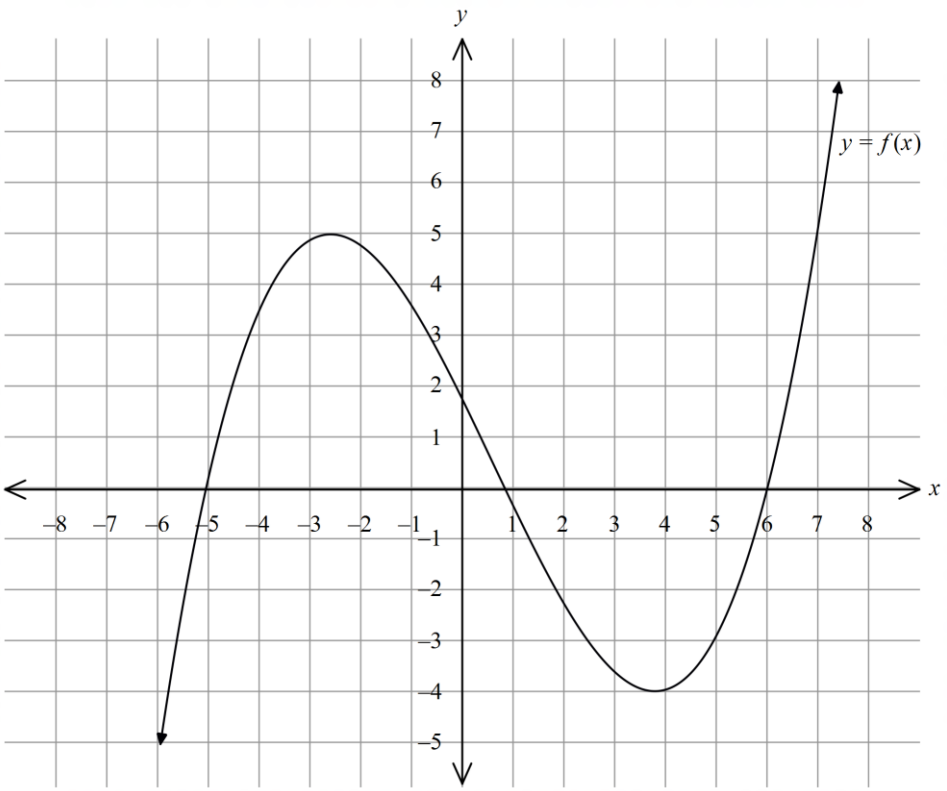
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5 Sketch $y = \dfrac{1}{x^2 - 4}$ showing all important features. **3**

For parts (a) and (b) in Question 6, answer on the grids drawn.

6 (a) Given $f(x) = 2^x$ draw the inverse function on the same axes. **1**

(b) The graph of $y = f(x)$ is given below. On the given number plane, sketch the graph of $y = f(|x|)$. Clearly indicate the key features. **2**



7 Solve $\frac{3}{4x-1} \geq 2$ **3**

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8 Find the values of x for which $\sqrt{x^2-3x-10}$ is real. **2**

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9 If $f(x)=\sqrt{3-x}$ and $g(x)=\sqrt{x}$ find the domain of $y=f\circ g(x)$. **2**

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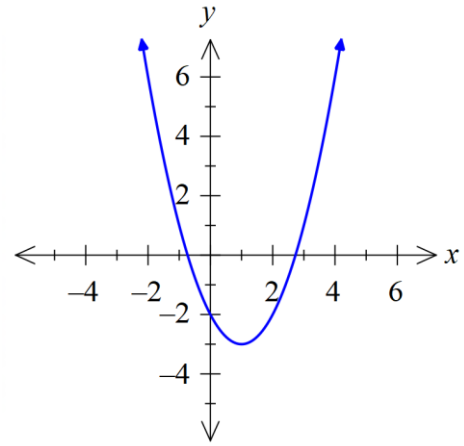
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10 The figure shows a sketch of $f(x)=(x-1)^2-3$.



(a) What is the largest positive domain for $f(x)$ so that an inverse function exists? **1**

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(b) Find the inverse function of $f(x)$. **2**

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11 Given the functions $f(x) = x^2 + 2x$ and $g(x) = x - 3$. Sketch the graph of $y = f(x)\ g(x)$, noting any key features. **3**

END OF ASSESSMENT TASK