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

Pymble Ladies' College

MATHEMATICS EXTENSION 1

Year 11

ASSESSMENT TASK 1

Term 1

2021

Time Allowed: 50 minutes

General Instructions

- Working time is 50 minutes.
- 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 30

Highest Mark	**/30**
Your Mark	**/30**

Blank Page

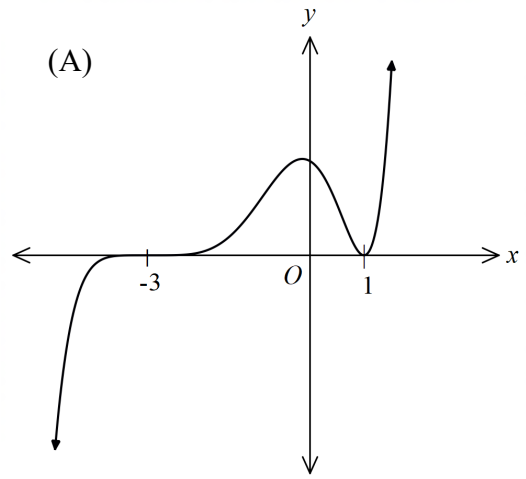
SECTION I
Multiple Choice (7 marks)

Answer these questions using the Multiple Choice answer sheet.

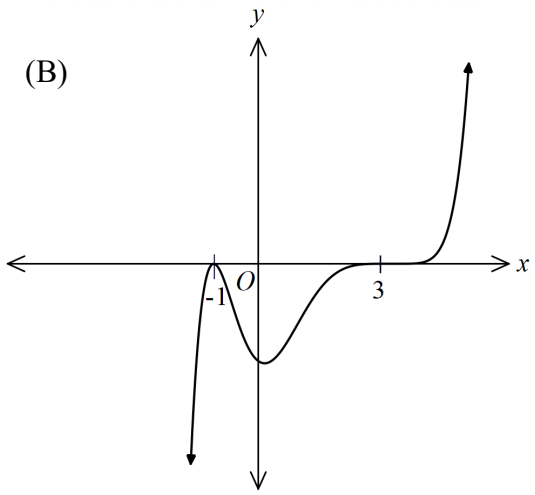
---

1 Which graph best represents the curve $y=(x-1)^2(x+3)^5$?

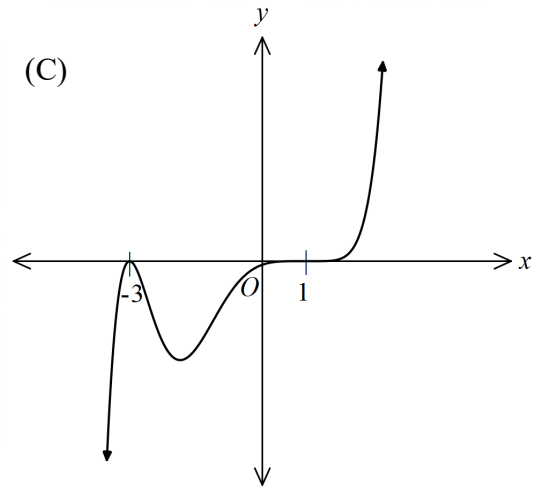
(A)



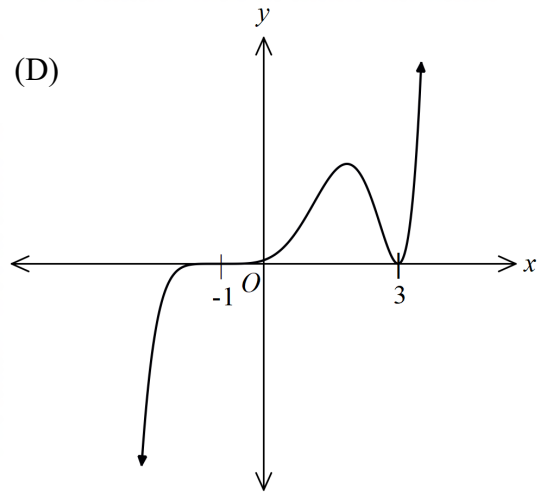
(B)



(C)



(D)



2 Let f and g be functions such that $f(2)=5$, $f(3)=4$, $g(2)=5$, $g(3)=2$ and $g(4)=1$.
What is the value of $f(g(3))$?

(A) 2

(B) 3

(C) 4

(D) 5

3 A circle with centre $(a,-2)$ and radius 5 units has equation $x^2-6x+y^2+4y=b$ where a and b are real constants.
What are the values of a and b respectively?

(A) -3 and 38

(B) 3 and 12

(C) -3 and -8

(D) 3 and 18

4 Which inequality defines the domain of the function $f(x)=\dfrac{1}{\sqrt{x^2-4}}$?

(A) $x\le -2$ or $x\ge 2$

(B) $x<-2$ or $x>2$

(C) $-2\le x\le 2$

(D) $-2<x<2$

5 Which of the following is the solution to the inequality $|x-3|\ge 5$?

(A) $-2\le x\le 8$

(B) $-2\ge x\ge 8$

(C) $x\le -2$ or $x\ge 8$

(D) $x\ge -2$ or $x\ge 8$

6 If $f(x-1)=x^2-2x+3$ then which of the following is equal to $f(x)$?

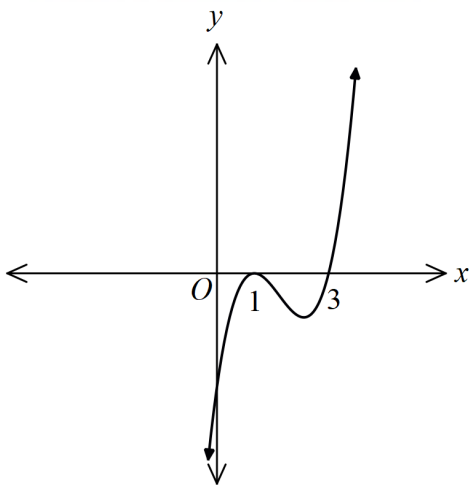
(A) x^2-2

(B) x^2+2

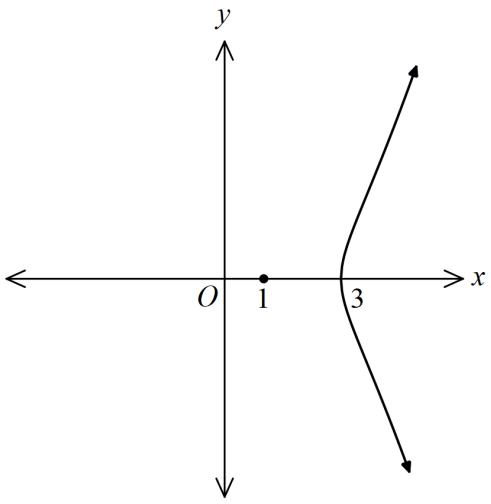
(C) x^2-2x+4

(D) x^2-4x+6

7 The graph of the function $y = f(x)$ is shown.



A second graph is obtained from the function $y = f(x)$.



Which equation best represents the second graph?

(A) $y^2 = |f(x)|$

(B) $y^2 = f(x)$

(C) $y = \sqrt{f(x)}$

(D) $y = f(\sqrt{x})$

SECTION II
23 Marks

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

---

8 Find the value(s) of m for which the quadratic equation $x^2-(m+2)x+4=0$ has no real roots. **3**

……
……
……
……
……
……
……
……

9 Given the function $f(x)=\sqrt{3-x}$ and $g(x)=x^2-3$ sketch $y=g(f(x))$ over its natural domain. **3**

10 (a) Sketch the graph of $y = |2x - 1|$. **1**

(b) Hence, or otherwise, solve $|2x - 1| \leq |x - 3|$. **3**

……

……

……

……

……

……

……

……

……

……

……

……

11 Sketch the graph of $f(x) = |x| + x$. **2**

12 Solve: $\frac{2}{x-3} \leq 5$. **3**

……

……

……

……

……

……

……

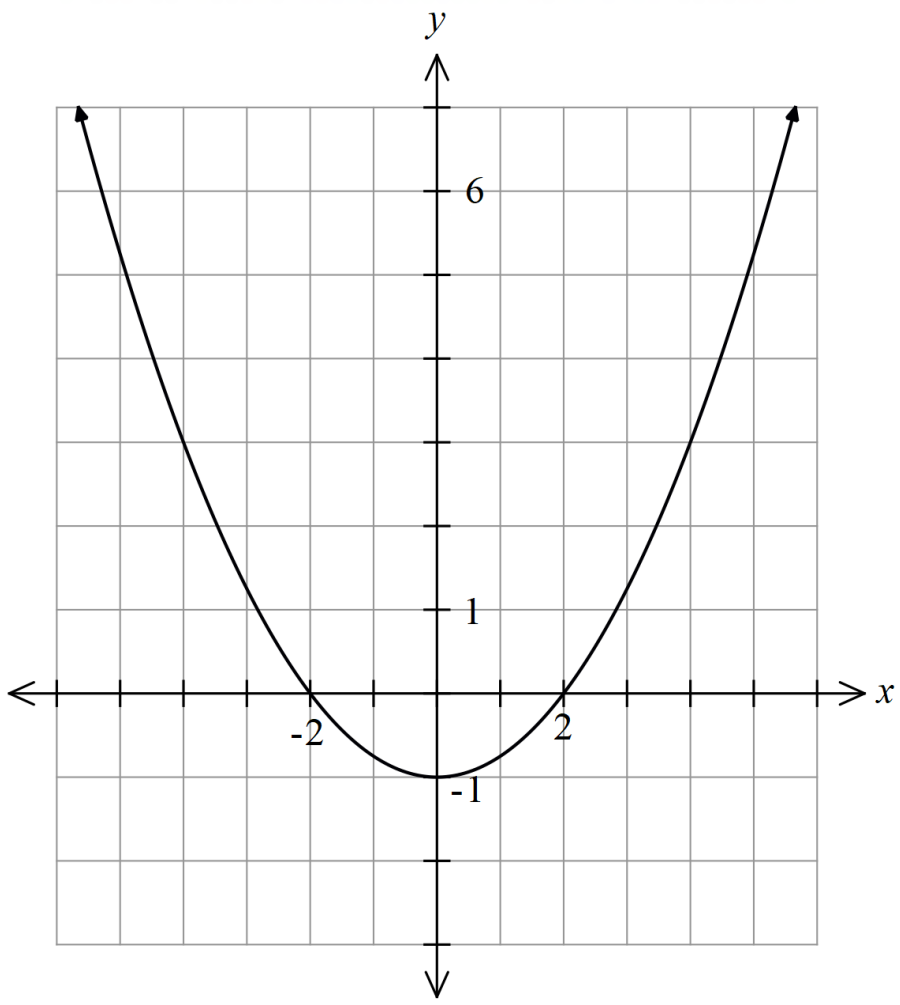
……

……

……

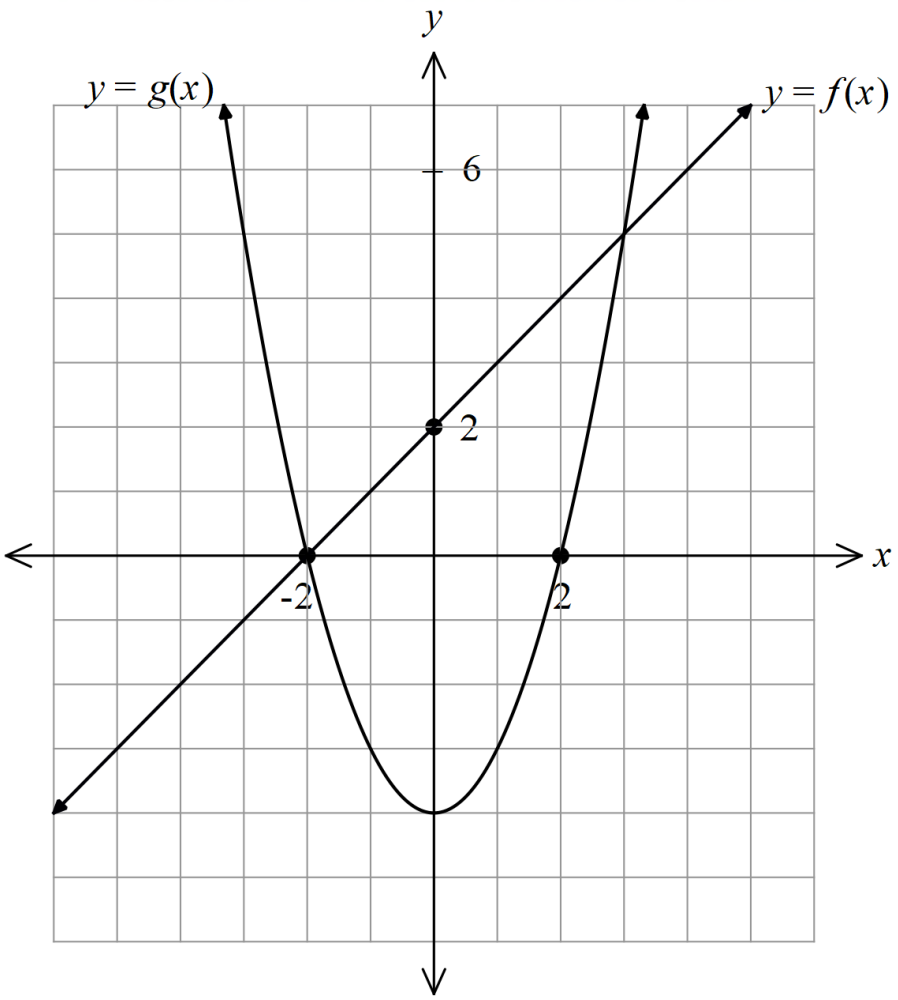
13 The function $y = f(x)$ is sketched. **2**

On the axes below, sketch the graph of $y = \sqrt{f(x)}$.



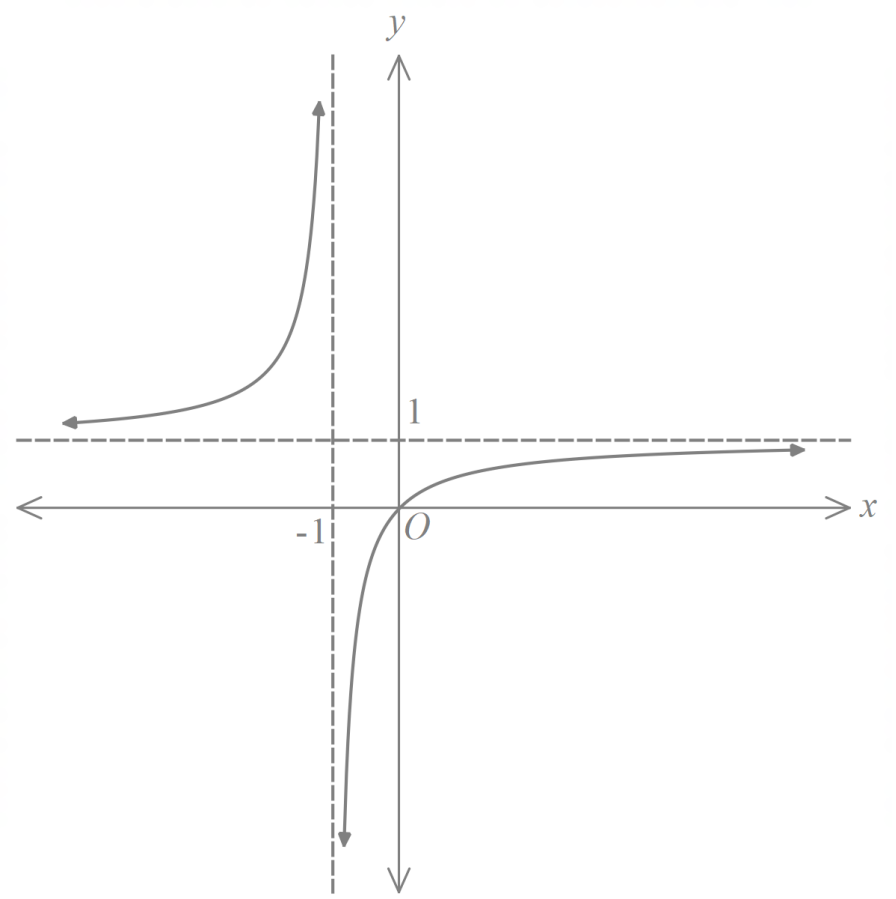
14 The function $y = f(x)$ and $y = g(x)$ are sketched on the same axes. **2**

Sketch the graph of $y = f(x) + g(x)$.



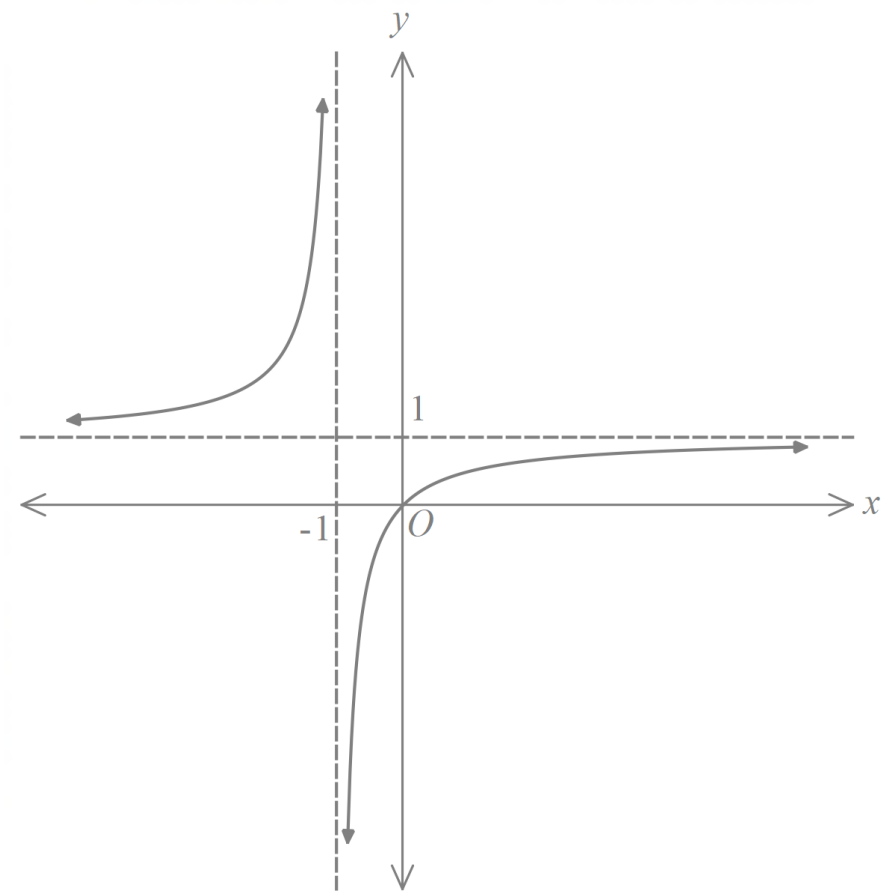
15 The graph of $y = f(x)$ has been sketched.

(a) On the axes below, sketch the graph $y = |f(x)|$, showing all intercepts and asymptotes. **2**



Part (b) of this question on next page.

(b) Sketch the graph $y = \dfrac{1}{f(x)}$, showing all intercepts and asymptotes. **2**



END OF ASSESSMENT TASK