**Temasek Junior College (IP)**
**2025 Year 4 Mathematics Structured Remedial**
**Term 2 Session 3 – Graphing Without GC**
**(Cubic and Reciprocal Graphs)**

**Questions**

**1** **(i)** Sketch the graph of $y = \frac{1}{x^2} - 1$, stating the coordinates of all the intersections with the axes and the equations of all the asymptotes.

**(ii)** By adding a suitable line to your graph, determine the number of solutions to the equation $\frac{2}{x} = x^2 + 3x$, showing your working clearly.

[2020/TJC/IP4/AM/WA1/Q4]

**2** **(i)** Find the values of $x$ that satisfies $x^3 = 4x$.

**(ii)** On the same set of axes, sketch the graphs of $y = 4x$ and $y = x^3$, labelling coordinates of intersection points, intersection with the axes.

**(iii)** Hence, state the range of values of $x$ which satisfies $x^3 > 4x$.

[2021/TJC/IP4/IM/WA1/Q4]

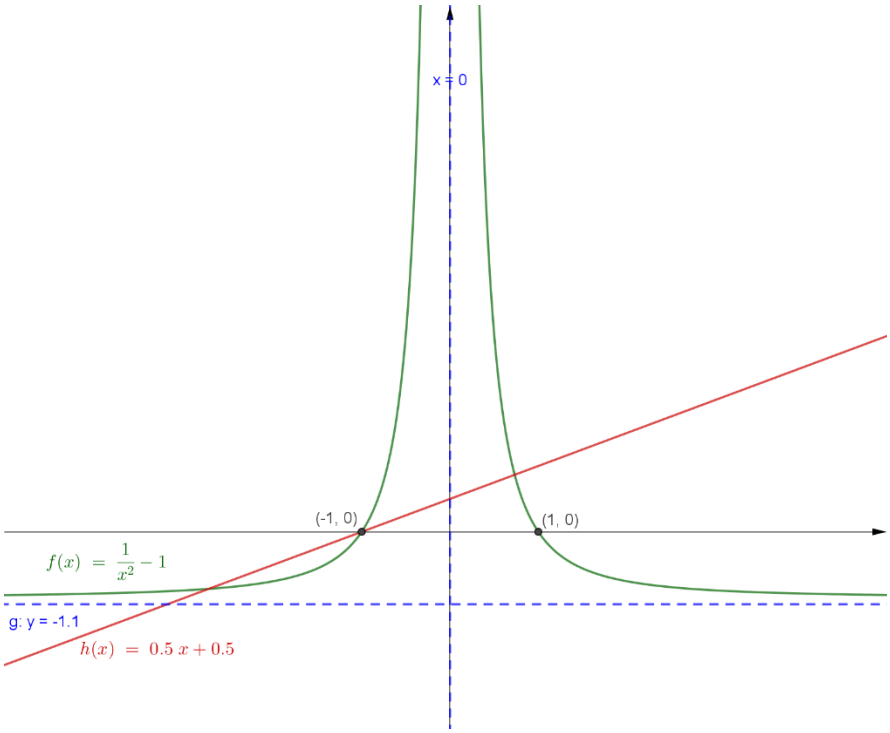
**3** **(i)** Sketch the graph of $y = \frac{2}{x-1}$, labelling the intersections with the axes and the asymptotes clearly.

**(ii)** By adding a suitable graph to **part (a)(i)**, find the range of values of $x$ where $\frac{2}{x-1} \geq 1$.

[2019/TJC/IP4/IM/WA1/Q2(a)]

**Answers**

**1.**

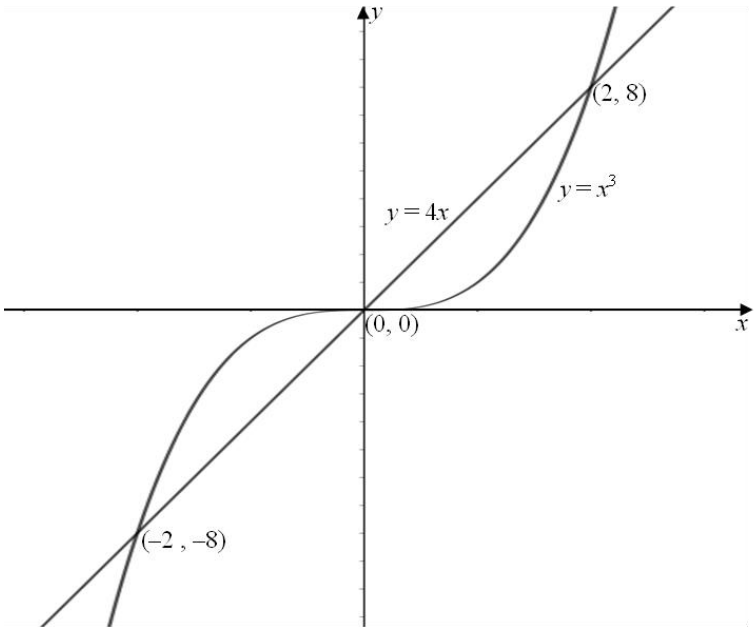



**(ii)** Sketch the line $y = \frac{1}{2}x + \frac{1}{2}$.

Number of solutions to the equation is 3.

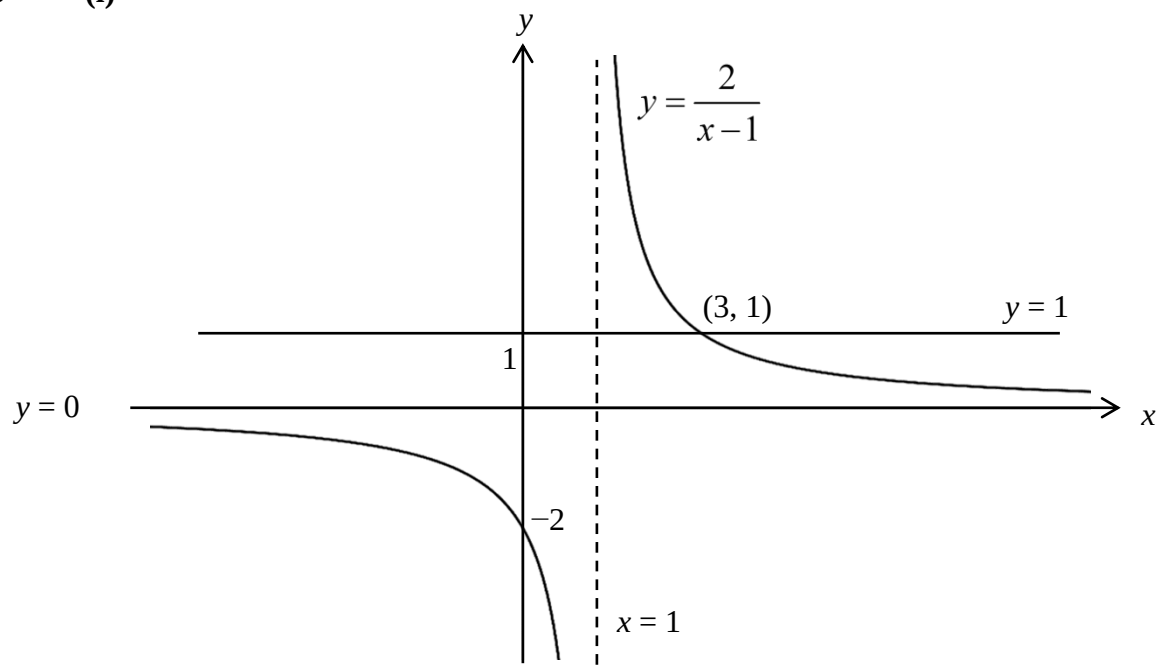
**2** **(i)** $x = 0$ or $x = -2$ or $x = 2$

**(ii)**




**(iii)** $-2 < x < 0$ or $x > 2$

**3** **(i)**




**(ii)** Sketch $y = 1$

$1 < x \leq 3$