

Cubic and Reciprocal Graphs

For AQA GCSE Mathematics (8300) • Higher tier

Name _____

Total marks: **24**

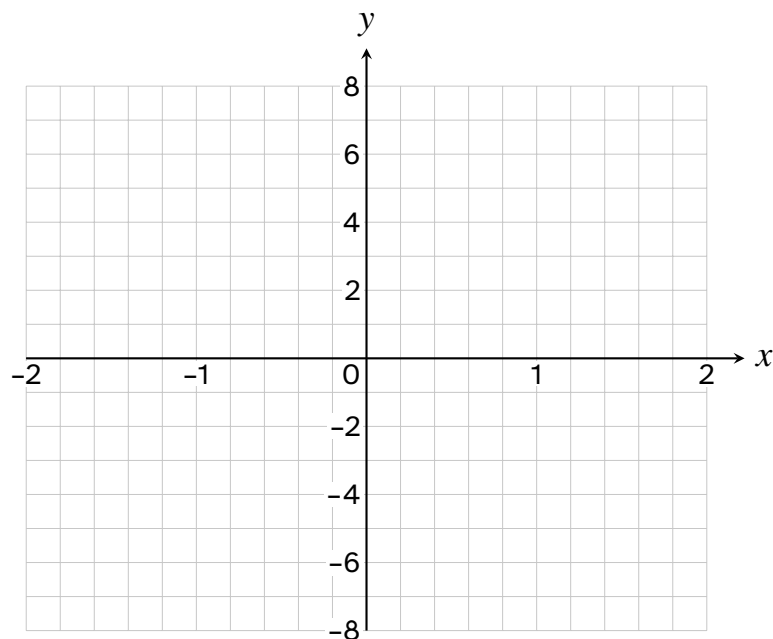
Answer **all** questions in the spaces provided. Show your working: marks are given for correct method.

- 1 (a) Complete the table of values for $y = x^3$

x	-2	-1	0	1	2
y		-1		1	

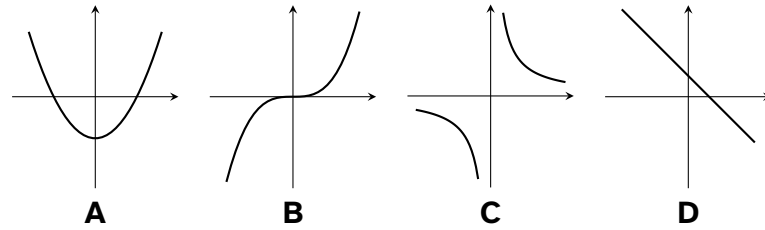
[2 marks]

- (b) Draw the graph of $y = x^3$ for values of x from -2 to 2



[2 marks]

2 Here are four sketch graphs.



(a) Write down the letter of the graph of $y = x^3$

[1 mark]

Answer _____

(b) Write down the letter of the graph of $y = \frac{1}{x}$

[1 mark]

Answer _____

(c) Write down the letter of the graph of $y = x^2 - 1$

[1 mark]

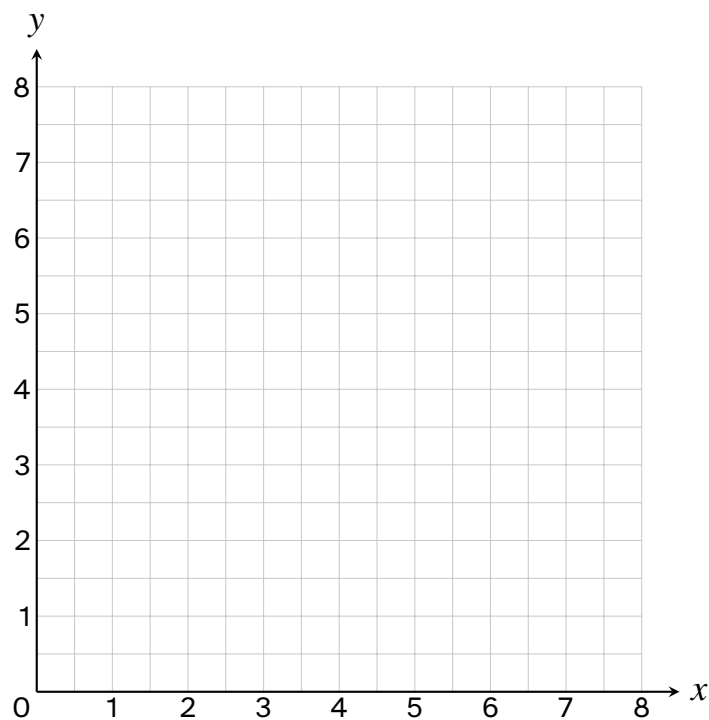
Answer _____

- 3 (a) Complete the table of values for $y = \frac{4}{x}$

x	0.5	1	2	4	8
y		4			0.5

[2 marks]

- (b) Draw the graph of $y = \frac{4}{x}$ for values of x from 0.5 to 8



[2 marks]

- 4 Explain why the graph of $y = \frac{1}{x}$ never crosses the y -axis.

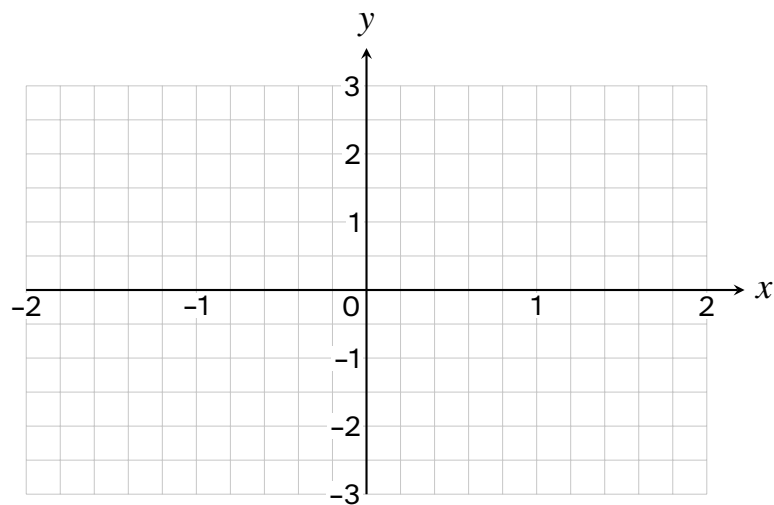
[1 mark]

- 5 (a) Complete the table of values for $y = x^3 - 3x$

x	-2	-1	0	1	2
y	-2		0		2

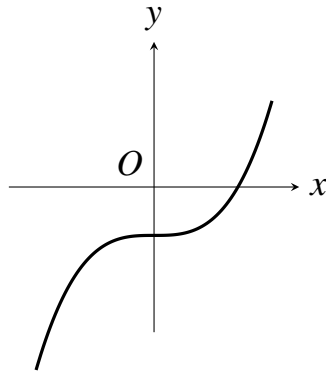
[2 marks]

- (b) Draw the graph of $y = x^3 - 3x$ for values of x from -2 to 2



[2 marks]

- 6 Here is a sketch of the graph of $y = x^3 + c$ where c is a constant.



Tick **one** box.

[1 mark]

☐ $c > 0$

☐ $c = 0$

☐ $c < 0$

- 7 Which point lies on the graph of $y = \frac{1}{x}$?
Circle your answer.

[1 mark]

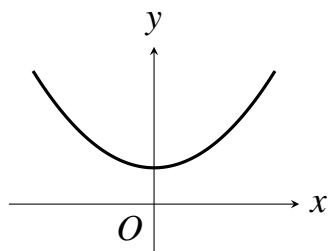
(0, 1)

(1, 0)

(-1, 1)

(2, 0.5)

- 8 Here is Ffion's sketch of the graph of $y = x^3$

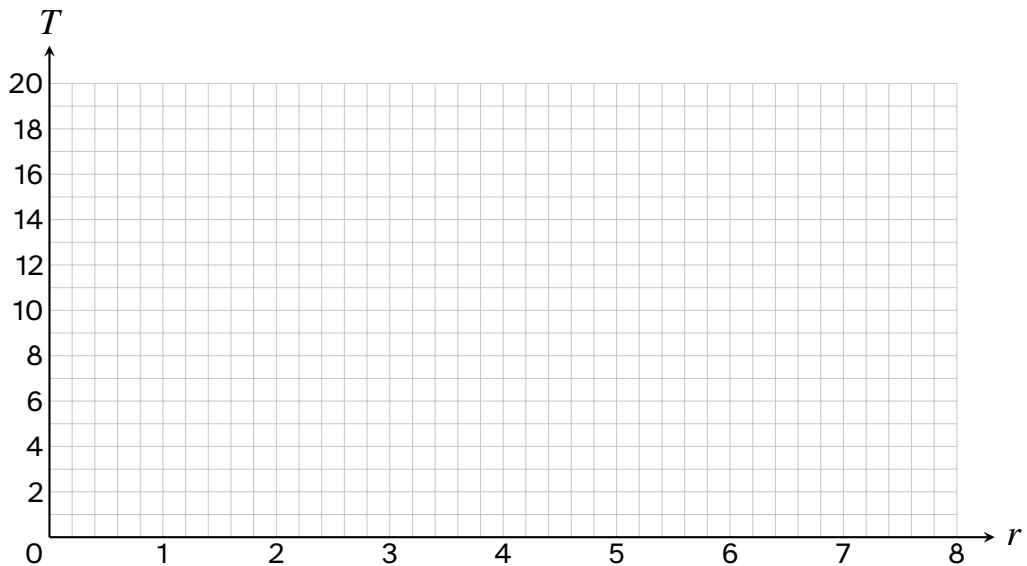


Give **two** reasons why her sketch is wrong.

[2 marks]

- 9 A fish tank holds 36 litres of water.
A pump fills the empty tank at a rate of r litres per minute.
The time, T minutes, it takes to fill the tank is given by $T = \frac{36}{r}$

(a) On the grid below, draw the graph of $T = \frac{36}{r}$ for values of r from 2 to 8



[2 marks]

- (b) Nisha's pump fills the tank in 10 minutes.
Use your graph to estimate the rate of Nisha's pump.

[2 marks]

Answer _____ litres per minute