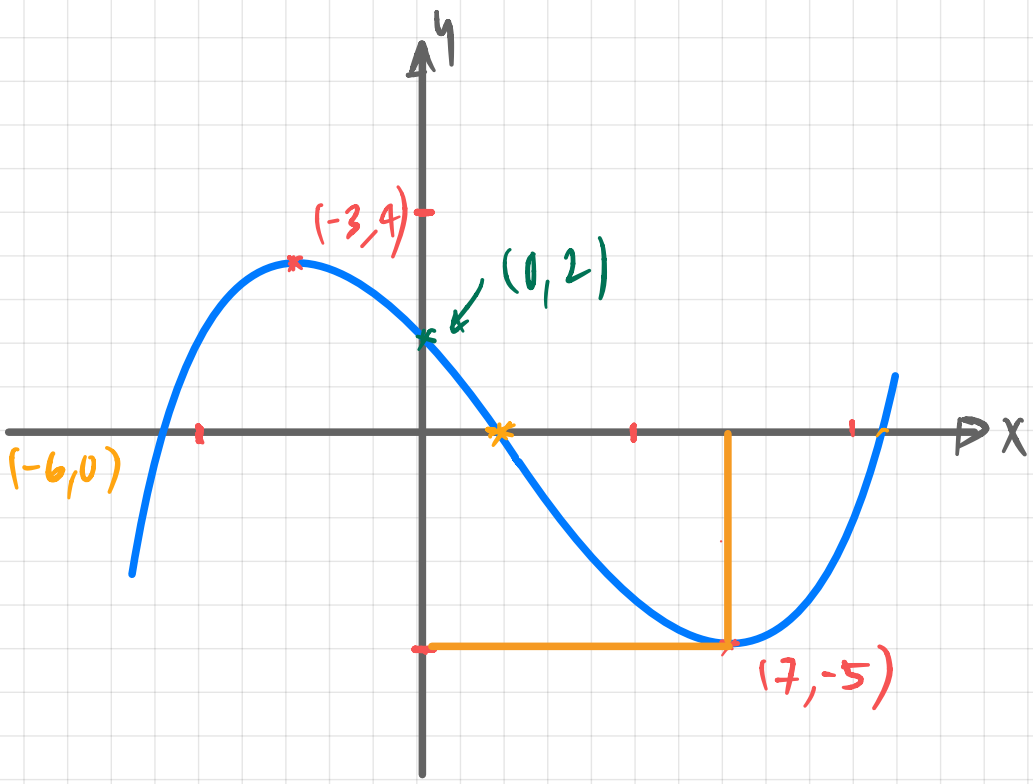
3.5)Functions and Graphs

Functions and Graphs

Function

$f(x) = \ldots$

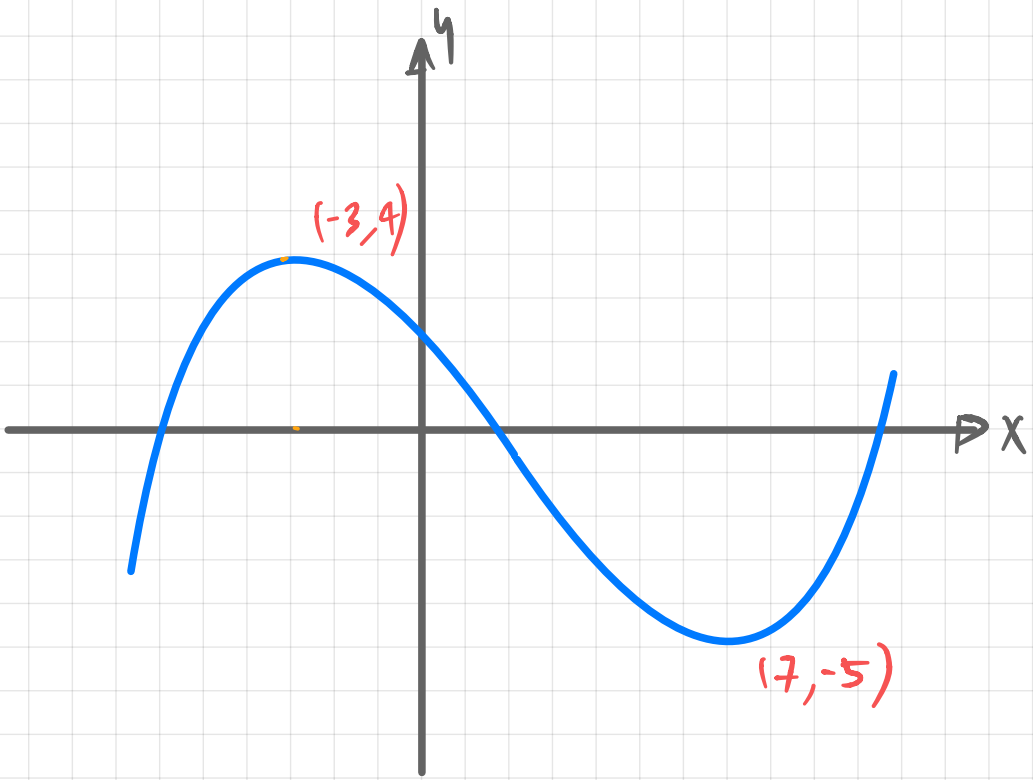


1) Find $f(0)$

2) Find A when $f(A) = -5$

Functions and Graphs

Gradient of graph



1) Gradient of graph is positive

Increasing function

2) Gradient of graph is negative

Decreasing function

Functions and Graphs

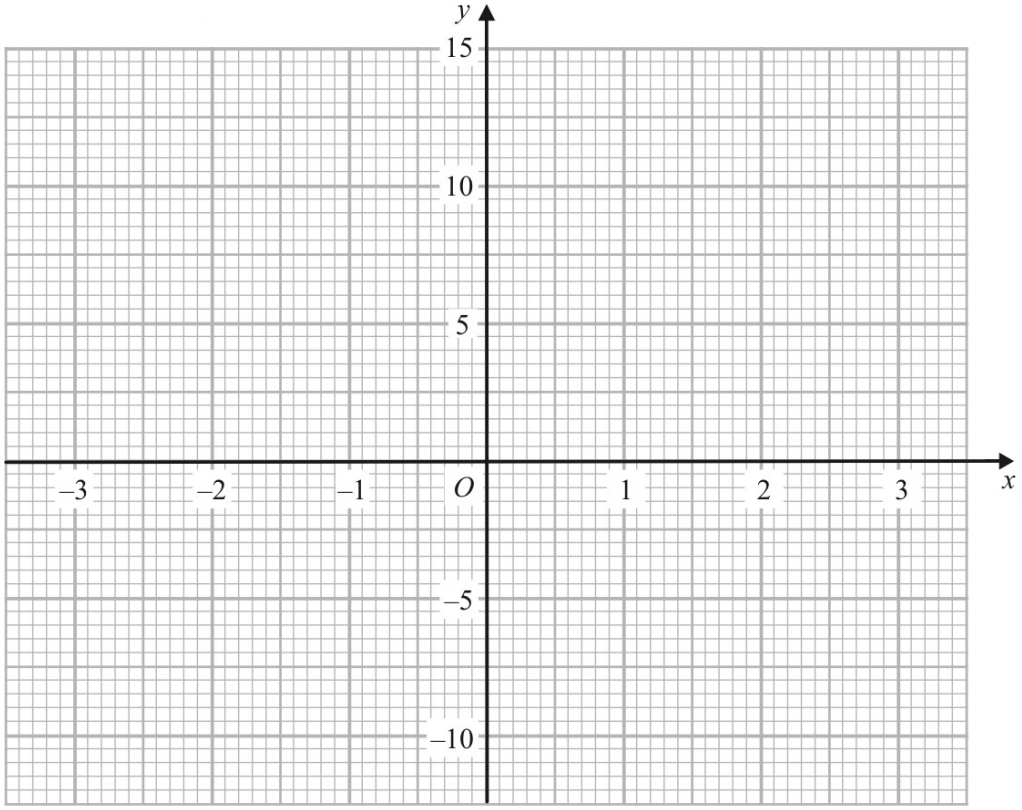
Complete the table and Sketch curve

Example $y = x^3 - 5x + 1$

(i) Complete the table.

x	-2.5	-1	0	0.5	1	2	3
y		5	1	-1.4			13

(ii) On the grid, draw the graph of $y = x^3 - 5x + 1$ for $-2.5 \leq x \leq 3$



(2)

Example

$$y = \frac{x}{2} - \frac{1}{x}$$

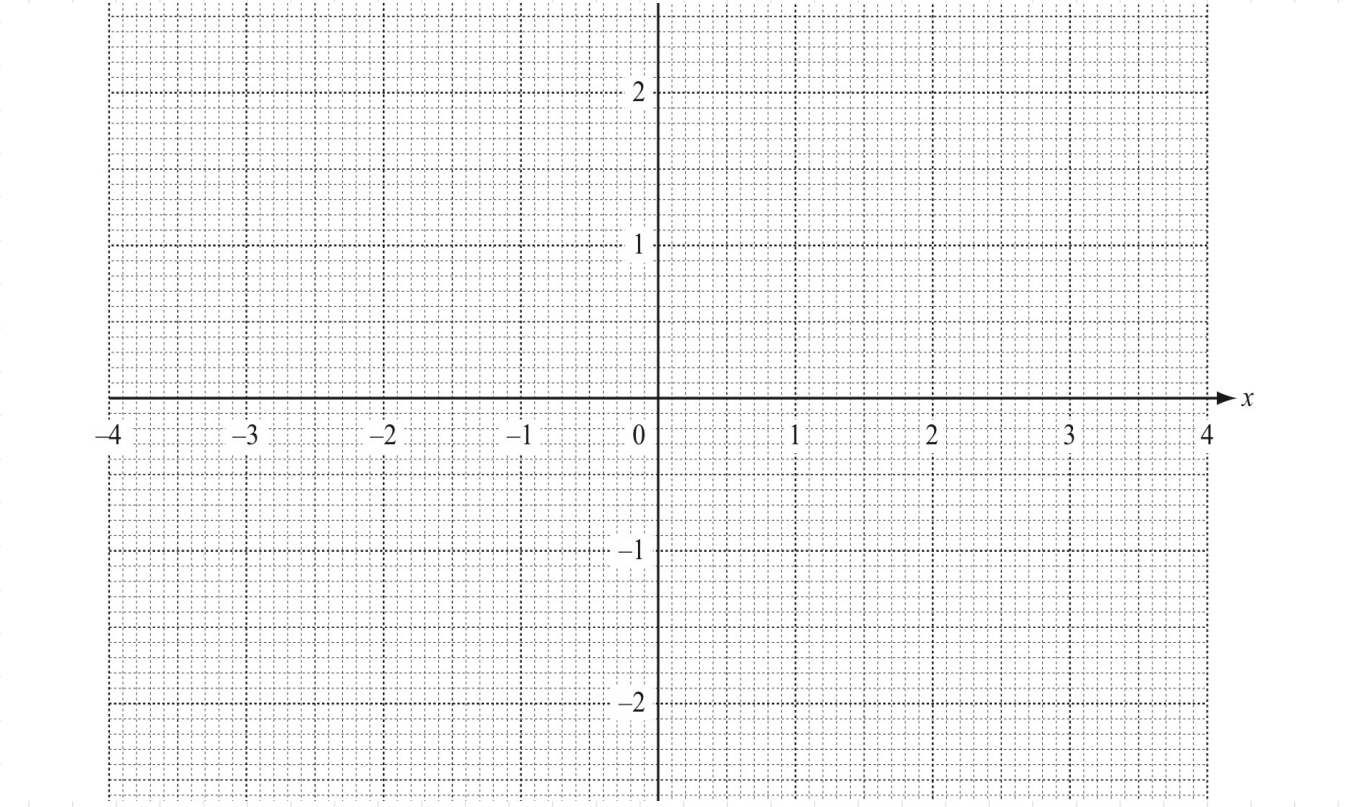
(i) Complete the table.

x	-4	-3	-2	-1.5	-1	-0.5	0.5	1	1.5	2	3	4
y		-1.17	-0.5	-0.08		1.75		-0.5	0.08	0.5	1.17	

(ii) On the grid, draw the graph of $y = \frac{x}{2} - \frac{1}{x}$

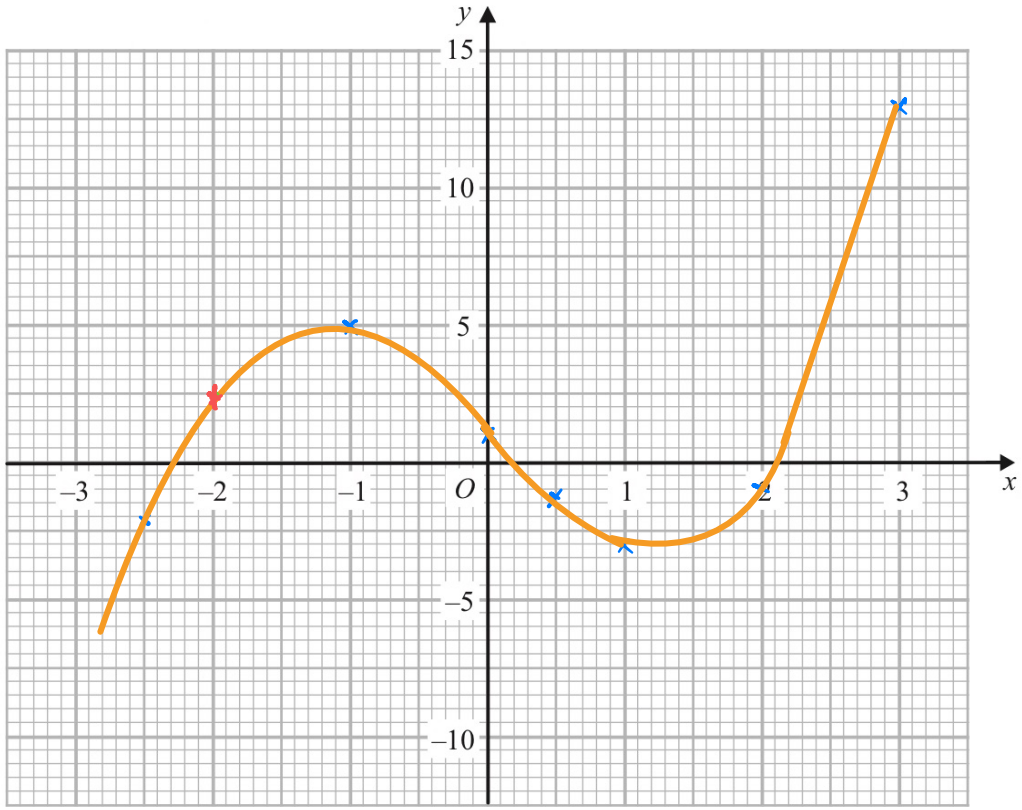
for $-4 \leq x \leq -0.5$ and $0.5 \leq x \leq 4$

x	-4	-3	-2	-1.5	-1	-0.5	0.5	1	1.5	2	3	4
y	-1.75	-1.17	-0.5	-0.08	0.5	1.75	-1.75	-0.5	0.08	0.5	1.17	1.75



Functions and Graphs

Gradient of graph at x=....



(2)

Find gradient of graph at x=-2

1) Tangent of curve at point x=-2

2) Coordinates of two any points from the tangent

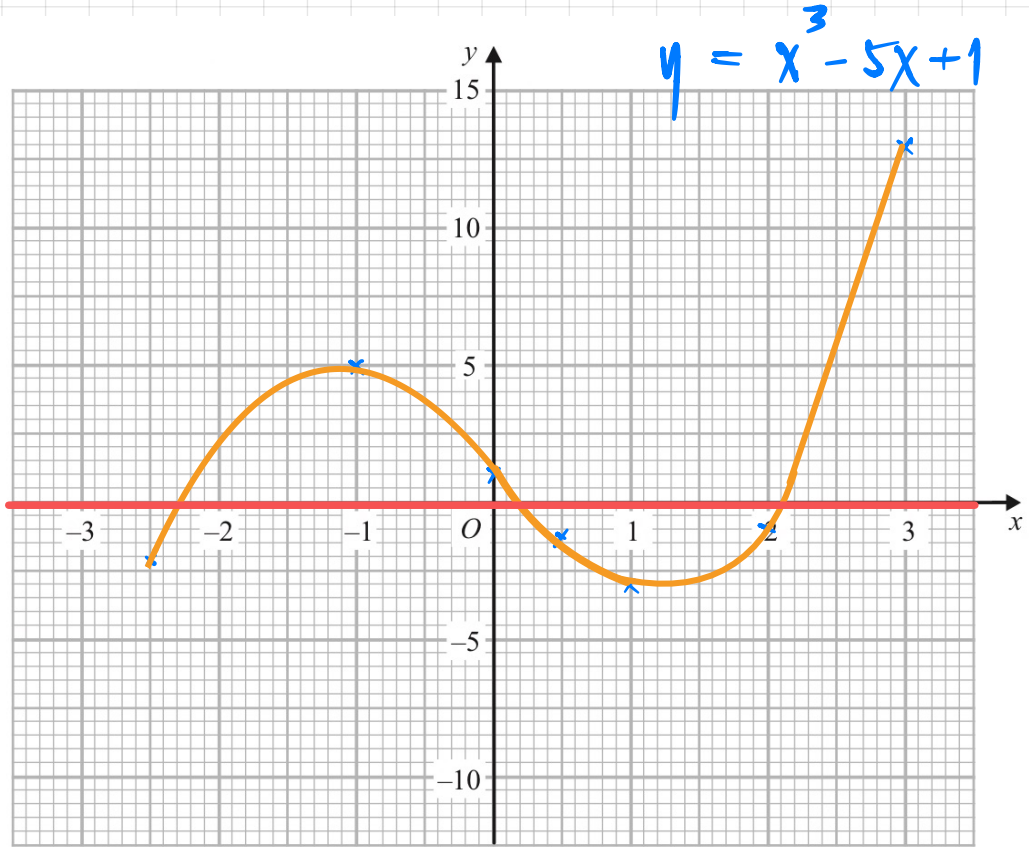
3) Find gradient of curve from gradient of two points

Use your graph to solve equation

Example $y = x^3 - 5x + 1$

Use your graph to solve equation

$$x^3 - 5x + 1 = 0$$



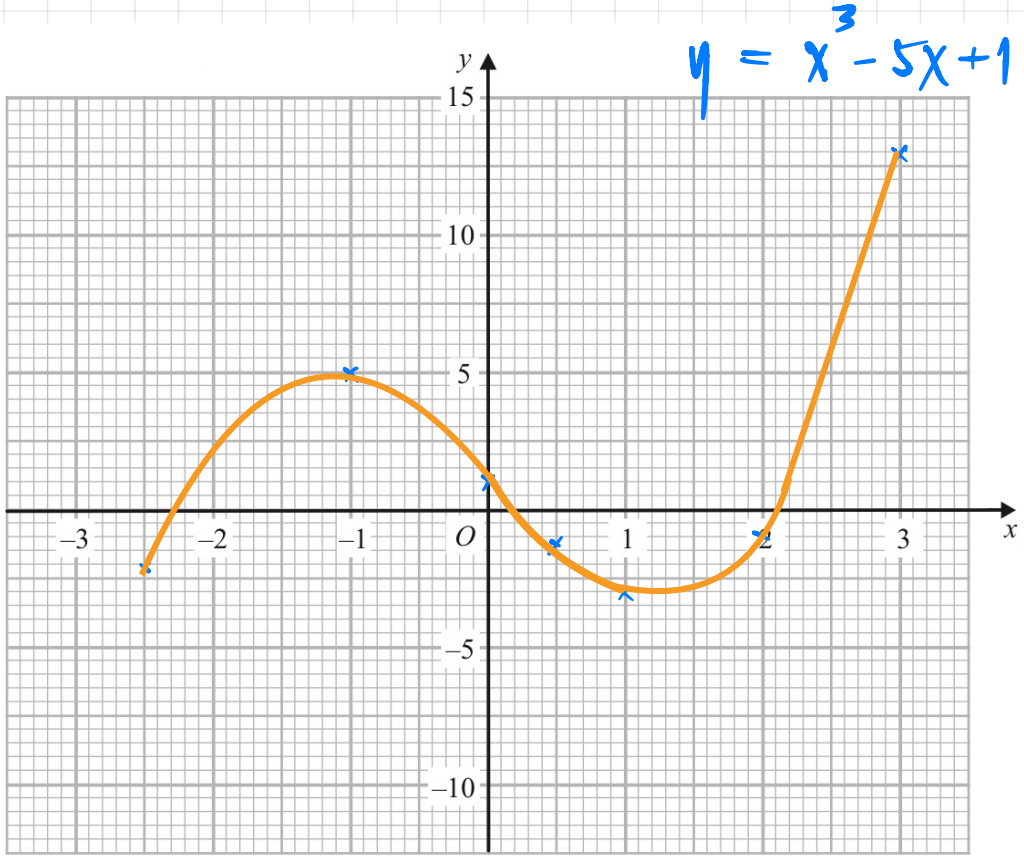
(2)

Example

$y = x^3 - 5x + 1$

Use your graph to solve equation

$x^3 - 5x + 1 = 5$



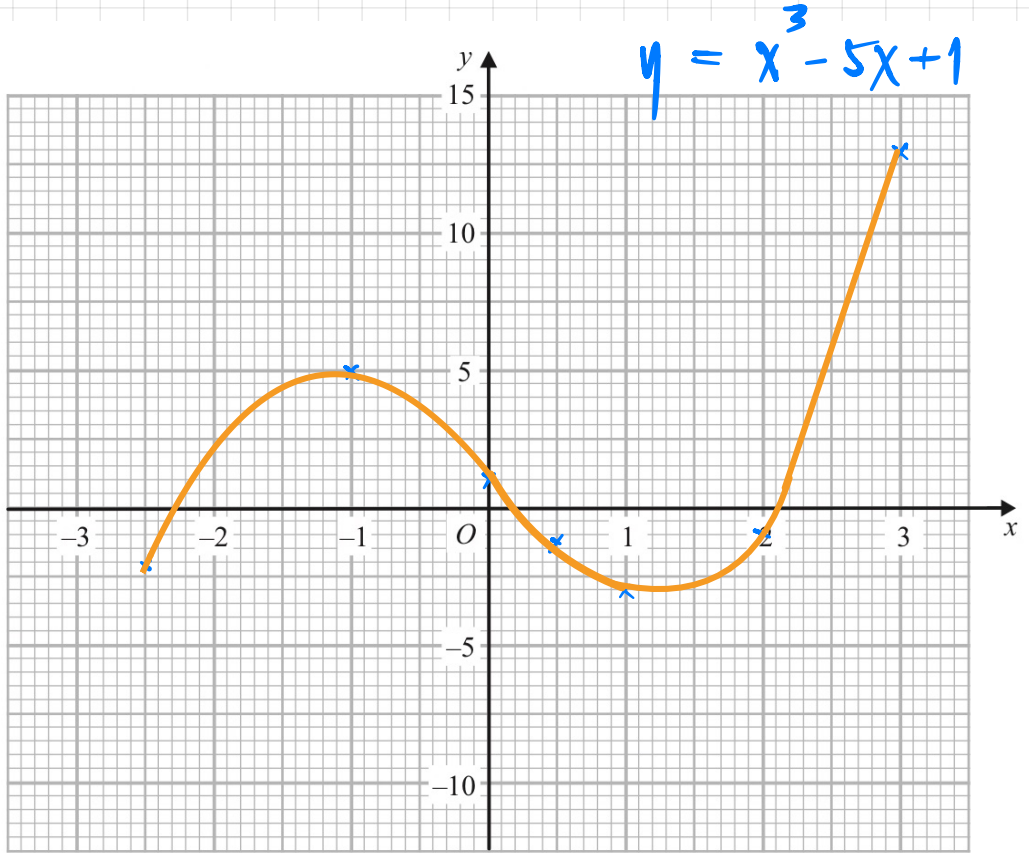
(2)

Example

$y = x^3 - 5x + 1$

Use your graph to solve equation

$x^3 - 5x = 7$

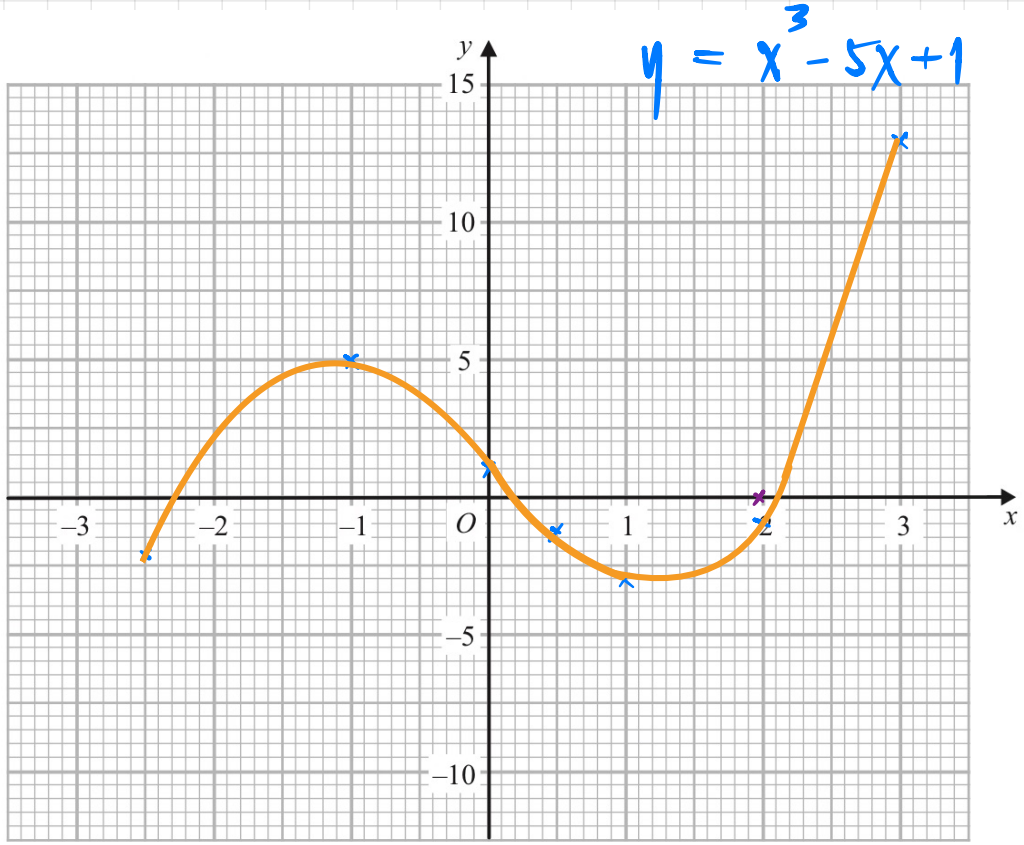


(2)

Example $y = x^3 - 5x + 1$

Use your graph to solve equation

$$x^3 - 6x + 3 = 0$$

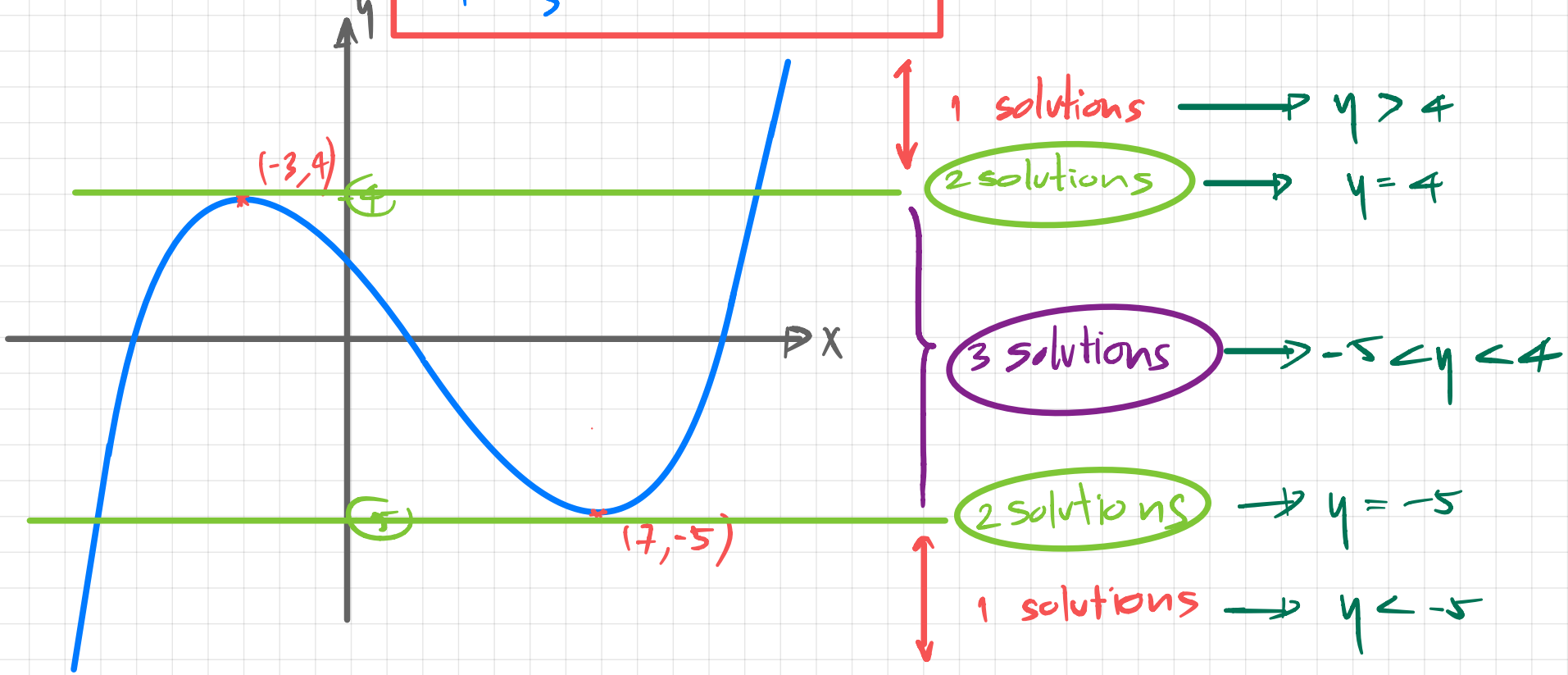


(2)

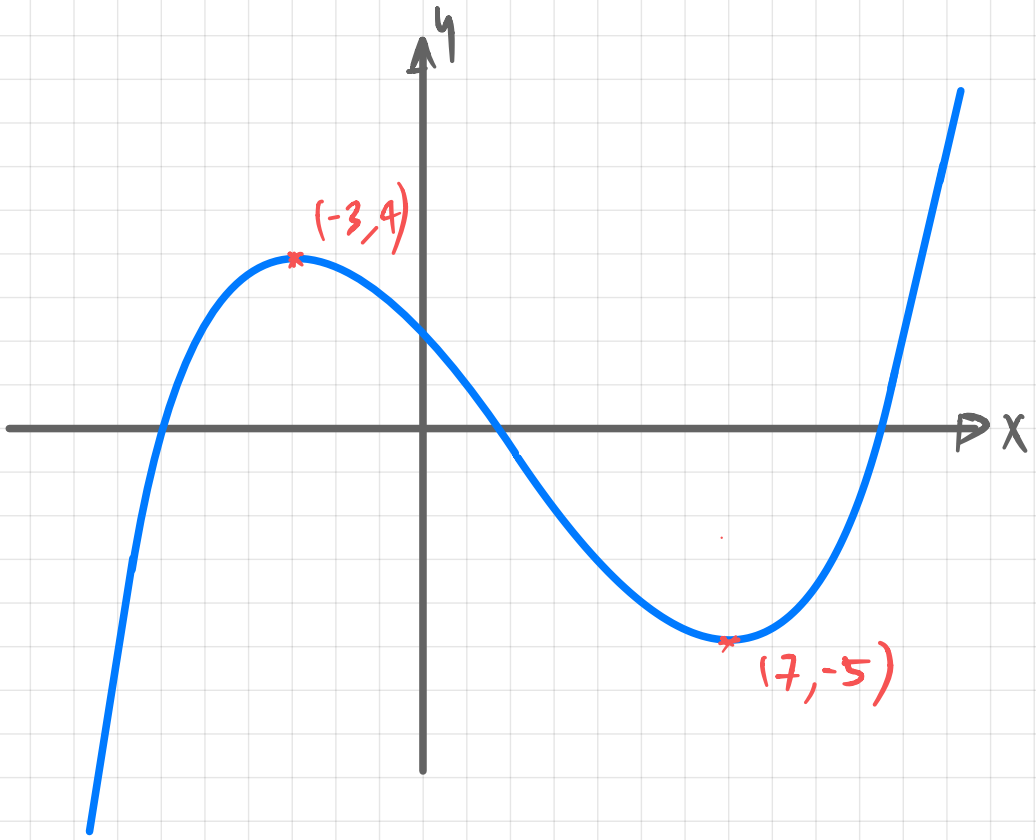
Functions and Graphs

Number of solutions (roots) → Number of intersection

$$y = \frac{1}{3}x^3 - 2x^2 - 3x + 2$$



$y = \frac{1}{3}x^3 - 2x^2 - 3x + 2$

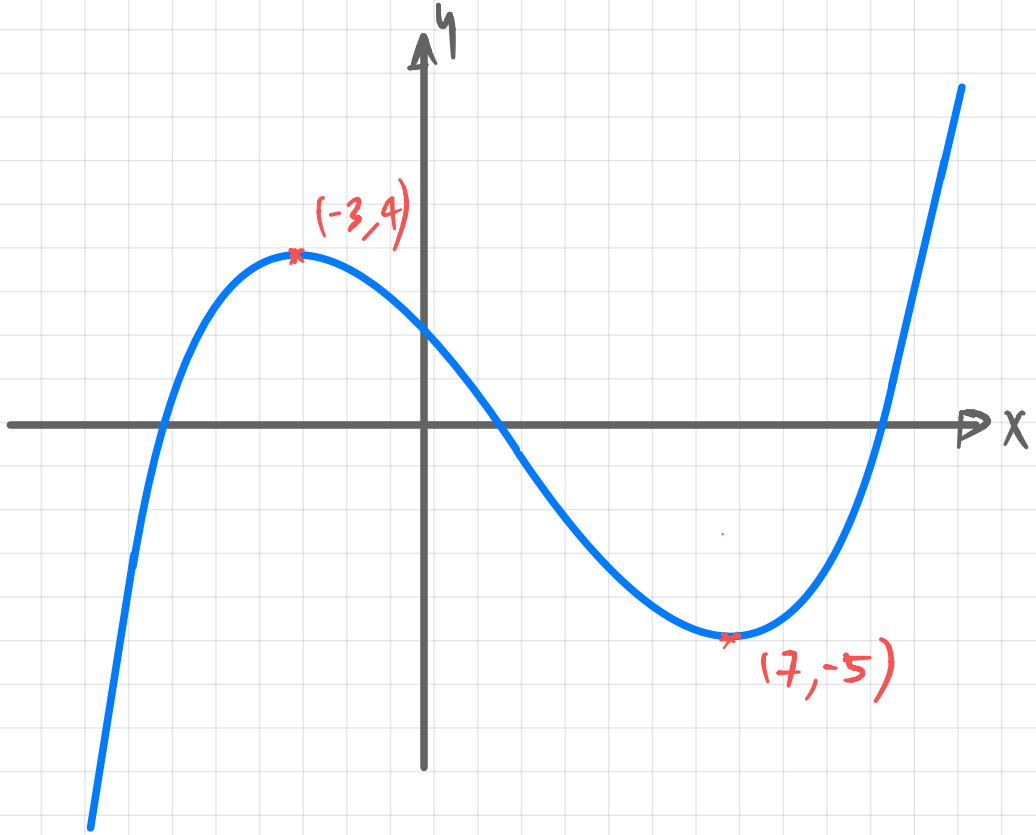


$\frac{1}{3}x^3 - 2x^2 - 3x + 2 = k$

has one solution; find values of k

Functions and Graphs

$y = \frac{1}{3}x^3 - 2x^2 - 3x + 2$



$\frac{1}{3}x^3 - 2x^2 - 3x + 2 = k$

has two solutions; find values of k

$y = \frac{1}{3}x^3 - 2x^2 - 3x + 2$

$\frac{1}{3}x^3 - 2x^2 - 3x + 2 = k$

has three solutions; find values of k