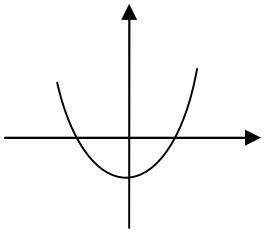
GRAF FUNGSI

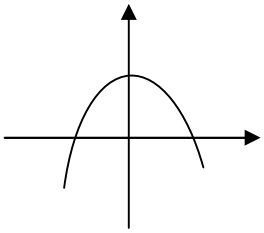
Panduan :

i. Tentukan jenis graf samada KUADRATIK / KUBIK / SALINGAN (*RECIPROCAL)*

KUADRATIK

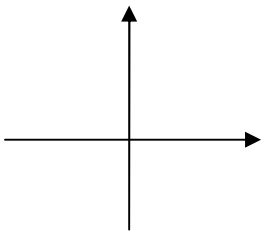


POSITIF

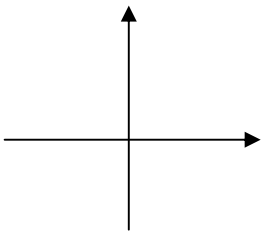


NEGATIF

KUBIK

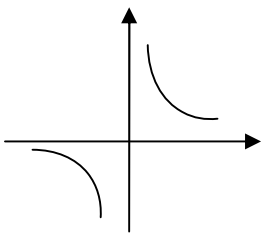


POSITIF

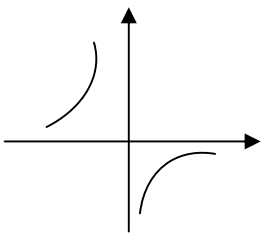


NEGATIF

SALINGAN



POSITIF



NEGATIF

ii. Cari nilai dengan menggunakan kalkulator *fx 570MS.*

Contoh : $y = 2x^3 + 4x - 2$

Tekan 2 Tekan ALPHA Tekan) Tekan ^ *Tekan 3 Tekan + Tekan 4 Tekan ALPHA Tekan)* Tekan – Tekan 2 Tekan CALC

Masukkan nilai x dan tekan =. Untuk nilai seterusnya tekan = lagi sekali, masukkan nilai x tekan =.

iii. Pastikan skala yang TEPAT untuk paksi-x dan paksi-y, Lukis graf dengan menggunakan PENSIL.

2.1 : Quadratic Graph

Example :

a) Complete the following table for the equation $y = 2x^2 - 4x - 5$

x	-2	-1	0	1	2	3	4	5
y	11		-5	-7		1		25

b) By using a scale of 2 cm to 1 unit on the x-axis and 2cm to 5 unit on the y-axis, draw the graph of $y = 2x^2 - 4x - 5$ for $-2 \le x \le 5$

c) From your graph, find

i) the value of y, when x = -1.5

ii) the values of x, when y= 0

d) Draw a suitable straight line on your graph to find the values of x which satisfy the equation $2x^2 - 8x + 3 = 0$ for $-2 \le x \le 5$. State the values of x.

Answer For Example :

a) x = -1, y = 1

x = 2, y = -5

x = 4, y = 11

b) Refer graph on the next page

c) i) y = 5.5

ii) x = -0.9, 2.9

Rearrange the equation so that one side of the equation is $2x^2 - 4x - 5$

d) $2x^2 - 8x + 3 = 0$

$$2x^2 = 8x - 3$$

$$2x^2 - 4x - 5 = 8x - 3 - 4x - 5$$

$$y = 4x - 8$$

Therefore, the appropriate graph that should be drawn is $y = 4x - 8$

x	0	1
y	-8	-4

From the graph, the solutions of the equation $2x^2 - 8x + 3 = 0$ are

x = 0.4, 3.65

Another Method

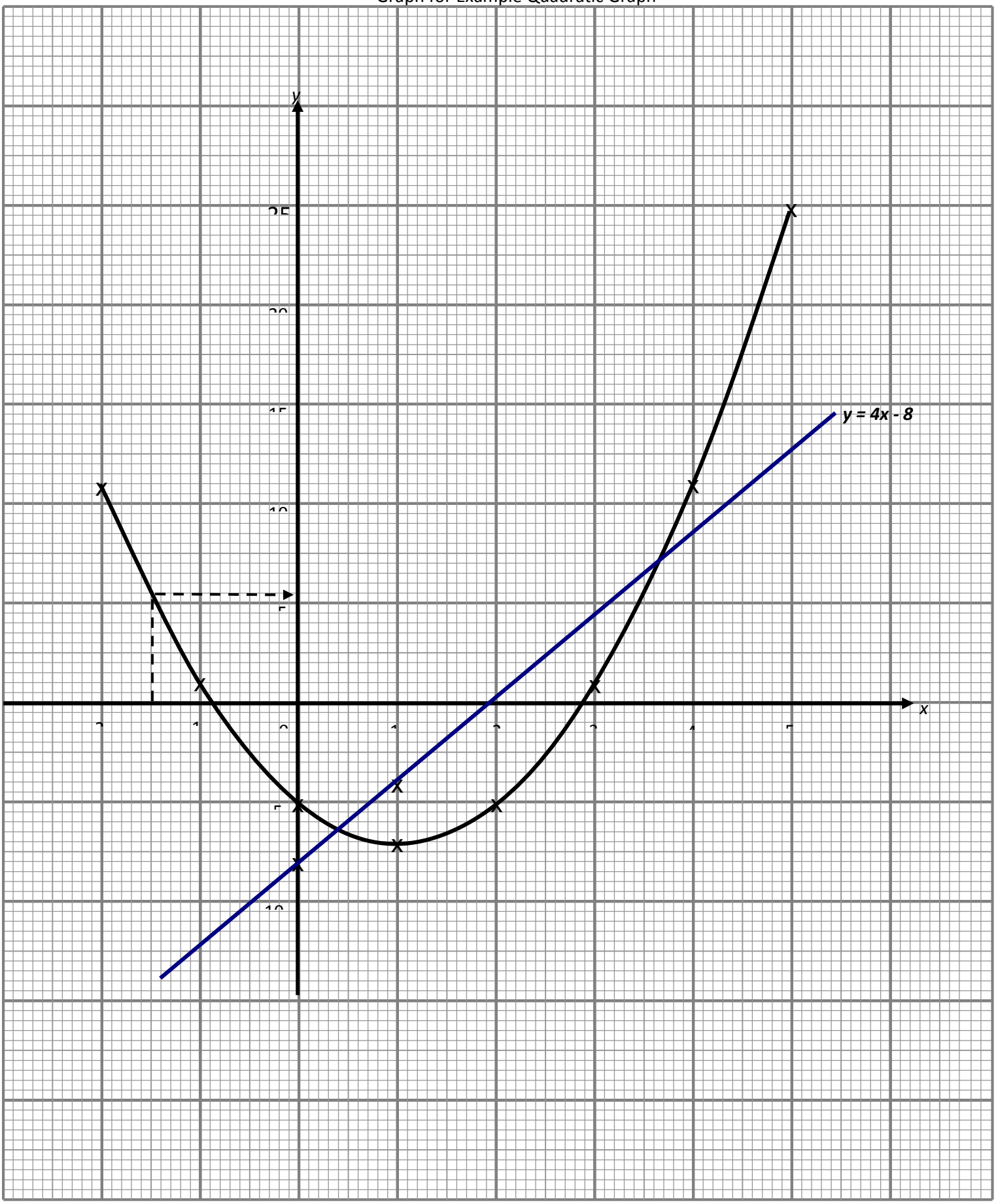
We can also use the discrimination method to find the appropriate graph to be drawn.

$$y = 2x^2 - 4x - 5 \ldots\ldots\ldots (1)$$

$$0 = 2x^2 - 8x + 3 \ldots\ldots\ldots (2)$$

$$(1) - (2) : y = 4x - 8$$

Graph for Example Quadratic Graph



Exercise 1 :

a) Complete the following table for the equation $y = 2x^2 - 9x + 5$

x	0	1	2	3	4	5	6	7
y	5	-2	-5		1	10		40

b) By using a scale of 2 cm to 1 unit on the x-axis and 2cm to 5 unit on the y-axis, draw the graph of $y = 2x^2 - 9x + 5$ for $0 \le x \le 7$

c) From your graph, find

i) the value of y, when x = 1.7

ii) the value of x, when y = 15

d) Draw a suitable straight line on your graph to find the values of x which satisfy the equation $2x^2 - 10x + 4 = 0$ for $0 \le x \le 7$. State the values of x.

Exercise 2 :

a) Complete the following table for the equation $y = 2x^2 - 5x - 7$

x	-3	-2	-1	0	1	2	3	4	5
y	26		0	-7	-10	-9		5	18

b) By using a scale of 2 cm to 1 unit on the x-axis and 2cm to 5 unit on the y-axis, draw the graph of $y = 2x^2 - 5x - 7$ for $-3 \le x \le 5$

c) From your graph, find

i) the value of y, when x = -2.5

ii) the value of x, when y = 15

d) Draw a suitable straight line on your graph to find the values of x which satisfy the equation $2x^2 - 7x + 4 = 0$ for $-3 \le x \le 5$. State the values of x.

Exercise 3:

a) Complete the following table for the equation $y = x(2x - 5) - 9$

x	-3	-2	-1	0	1	2	3	4	5
y	24		-2	-9	-12	-11		3	6

b) By using a scale of 2 cm to 1 unit on the x-axis and 2cm to 5 unit on the y-axis, draw the graph of $y = x(2x - 5) - 9$ for $-3 \le x \le 5$

c) Draw a suitable straight line on your graph to find the values of x which satisfy the equation $x(2x - 5) - 9 = 4 - 2x$ for $-3 \le x \le 5$. State the values of x.

Exercise 4 :

a) Complete the following table for the equation $y = -3x^2 + 2x + 5$

x	-3	-2	-1	0	1	2	3	4
y		-11	0		4		-16	-35

b) By using a scale of 2 cm to 1 unit on the x-axis and 2cm to 5 unit on the y-axis, draw the graph of $y = -3x^2 + 2x + 5$ for $-3 \le x \le 4$

c) From your graph, find

i) the value of y, when x = -0.5

ii) the value of x, that satisfy the equation of $3x^2 - 2x = 5$

d) Draw a suitable straight line on your graph to find the values of x which satisfy the equation $3x^2 + 2x - 25 = 0$ for $-3 \le x \le 4$. State the values of x.

Exercise 5 :

a) Complete the following table for the equation $y = \frac{1}{2}x(8 - x)$

x	0	0.5	1	2	3	4	5	6	7
y	0	1.88		6	7.5		7.5		3.5

b) By using a scale of 2 cm to 1 unit on the x-axis and 2cm to 1 unit on the y-axis, draw the graph of $y = \frac{1}{2}x(8 - x)$ for $0 \le x \le 7$

c) Draw a suitable straight line on your graph to find the values of x which satisfy the equation $x(8 - x) = 10$ for $0 \le x \le 7$. State the values of x.

2.2 : Cubic Graph

Example 1:

a) Complete the following table for the equation $y = x^3 - 8x + 5$

x	-3	-2	-1	0	1	2	3	3.5	4
y	2		12	5		-3		19.9	37

b) By using a scale of 2 cm to 1 unit on the x-axis and 2cm to 5 unit on the y-axis, draw the graph of $y = x^3 - 8x + 5$ for $-3 \le x \le 4$

c) From your graph, find

i) the value of y, when x = -1.4

ii) the value of x, when y= 25

d) Draw a suitable straight line on your graph to find the values of x which satisfy the equation $x^3 - 12x - 1 = 0$ for $-3 \le x \le 4$. State the values of x.

Answer For Example :

a) x = -2, y = 13

x = 1, y = -2

x = 3, y = 8

b) Refer graph on the next page

c) i) y = 13. 5

ii) x = 3.7

d) $x^3 - 12x - 1 = 0$

$x^3 = 12x + 1$

$x^3 - 8x + 5 = 12x + 1 - 8x + 5$

$y = 4x + 6$

Rearrange the equation so that one side of the equation is $x^3 - 8x + 5$

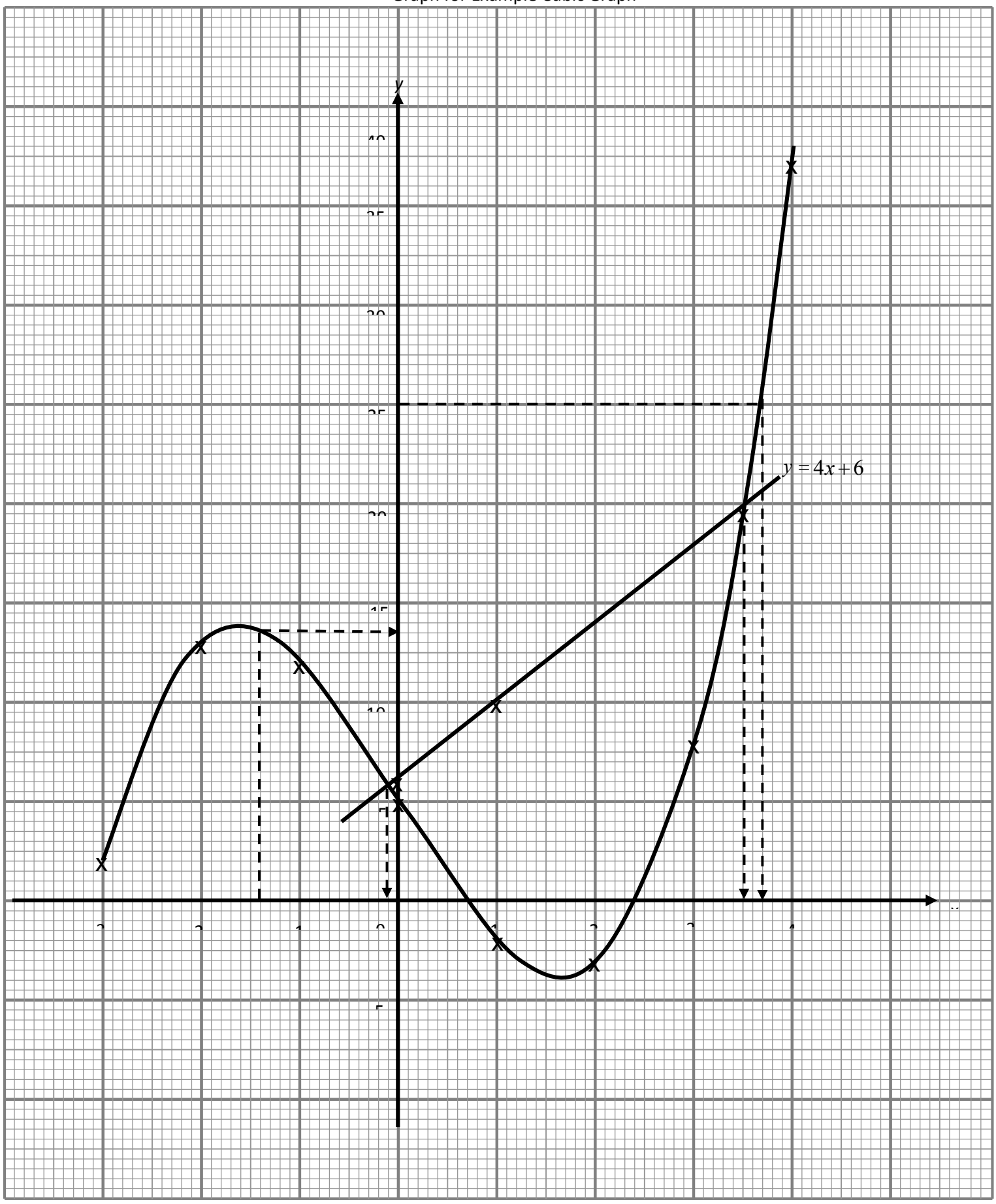
Therefore, the appropriate graph that should be drawn is $y = 4x + 6$

x	0	1
y	6	10

From the graph, the solutions of the equation $x^3 - 12x - 1 = 0$ are

x = –0.1, 3.5

Graph for Example Cubic Graph



Exercise 1:

a) Complete the following table for the equation $y = x^3 - 10x + 5$

x	-3.5	-3	-2	-1	0	1	2	3	3.5
y	-2.9	8		14	5		-7		12.9

b) By using a scale of 2 cm to 1 unit on the x-axis and 2cm to 5 unit on the y-axis, draw the graph of $y = x^3 - 10x + 5$ for $-3.5 \le x \le 3.5$

c) From your graph, find the value of y, when x = -2.5

d) Draw a suitable straight line on your graph to find the values of x which satisfy the equation $x^3 - 10x = 6$ for $-3.5 \le x \le 3.5$. State the values of x.

Exercise 2:

a) Complete the following table for the equation $y = x^3 - 10x + 18$

x	-3	-2	-1	0	1	2	3	3.5	4
y	21		27	18		6		25.88	42

b) By using a scale of 2 cm to 1 unit on the x-axis and 2cm to 5 unit on the y-axis, draw the graph of $y = x^3 - 10x + 18$ for $-3 \le x \le 4$

c) From your graph, find the value of y, when x = -0.5

d) Draw a suitable straight line on your graph to find the values of x which satisfy the equation $x^3 - 10x - 10 = 0$ for $-3. \le x \le 4$. State the values of x.

Exercise 3:

a) Complete the following table for the equation $y = x^3 - 12x + 7$

x	-4	-3	-2	-1	0	1	2	3	4
y	-9	16		18	7	-4	-9		23

b) By using a scale of 2 cm to 1 unit on the x-axis and 2cm to 5 unit on the y-axis, draw the graph of $y = x^3 - 12x + 7$ for $-4 \le x \le 4$

c) From your graph, find

i) the value of y, when x = 2.5

ii) the values of negative x that satisfy the equation $x^3 = 12x - 7$

d) Draw a suitable straight line on your graph to find the values of x which satisfy the equation $x^3 - 15x + 2 = 0$ for $-4 \le x \le 4$. State the values of x.

Exercise 4:

a) Complete the following table for the equation $y = x^3 - 12x + 6$

x	-5	-4	-3	-2	-1	0	1	2	3	4
y	-59	-10		22	17	6	-5		-3	22

b) By using a scale of 2 cm to 1 unit on the x-axis and 2cm to 10 unit on the y-axis, draw the graph of $y = x^3 - 12x + 6$ for $-5 \le x \le 4$

c) From your graph, find

i) the value of y, when x = -2.5

ii) the values of positive x, when y = 0

d) Draw a suitable straight line on your graph to find the values of x which satisfy the equation $x^3 - 12x = 12$ for $-4 \le x \le 4$. State the values of x.

Exercise 5:

a) Complete the following table for the equation $y = x^3 - 5x - 12$

x	-3	-2	-1.5	-1	0	1	2	3	3.5
y		-10	-7.9	-8	-12	-16		0	13.4

b) By using a scale of 2 cm to 1 unit on the x-axis and 2cm to 5 unit on the y-axis, draw the graph of $y = x^3 - 5x - 12$ for $-3 \le x \le 3.5$

c) From your graph, find

i) the value of y, when x = 0.8

ii) the value of x which satisfies the equation $x^3 - 5x = 12$

d) Draw a suitable straight line on your graph to find the values of x which satisfy the equation $x^3 - 9x = 4$ for $-3 \le x \le 3.5$. State the values of x.

2.3 : Reciprocal Graph

Example 1:

a) Complete the following table for the equation $y = \frac{8}{x}$

x	-5	-4	-2.5	-1.6	-1	1	1.6	2.5	4	5
y		-2		-5	-8	8		3.2	2	1.6

b) By using a scale of 2 cm to 1 unit on the x-axis and 2cm to 2 unit on the y-axis, draw the graph of

$y = \frac{8}{x}$ for $-5 \le x \le 5$

c) From your graph, find

i) the value of y, when x = -3.2

ii) the value of x, when y = 4.4

d) From the graph, state the values of x when x and y have a same value.

Answer For Example :

a) x = -5, y = -1.6

x = -2.5, y = -3.2

x = 1.6, y = 5

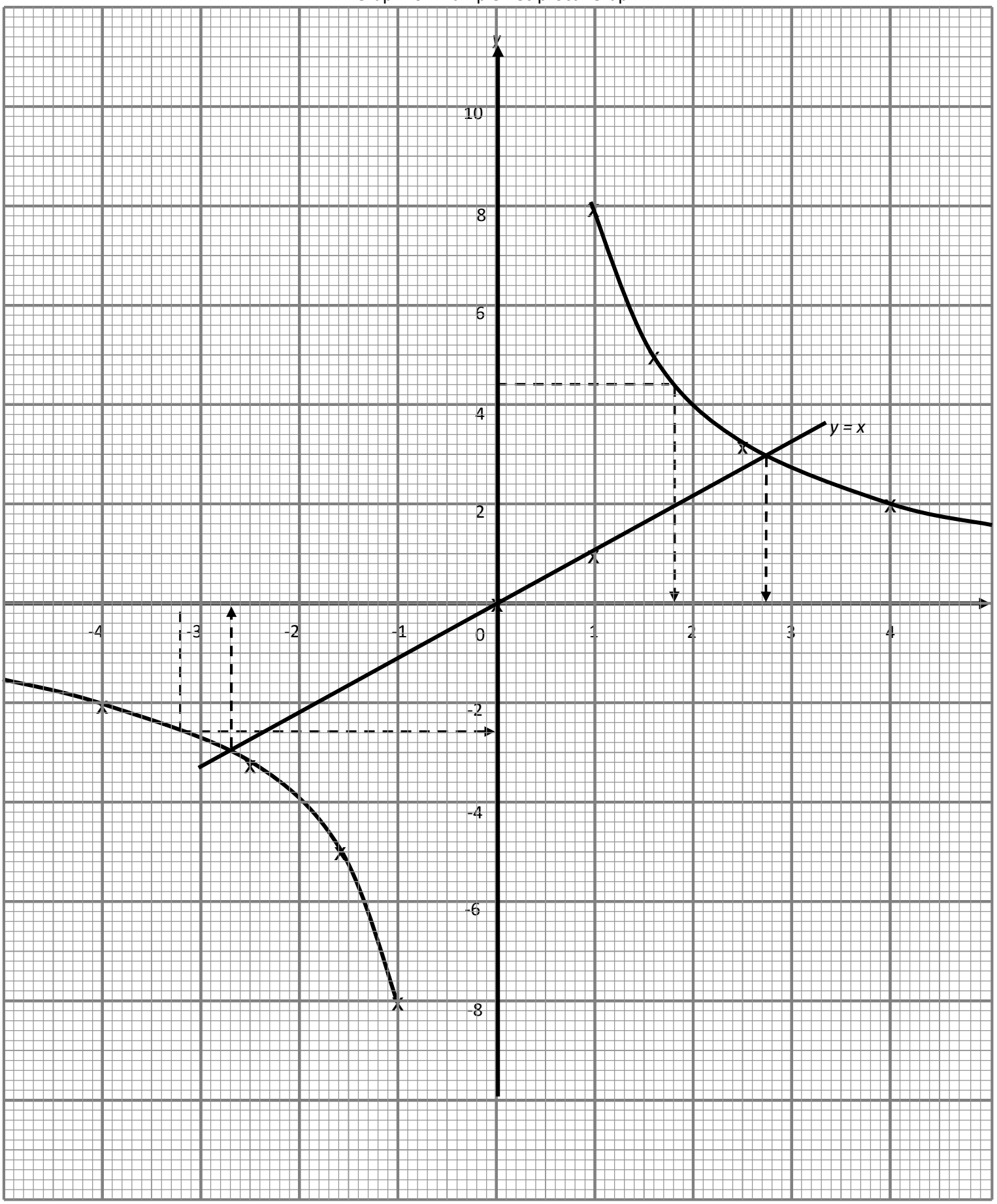
b) Refer graph on the next page

c) i) y = -2.6

ii) x = 1.8

d) x = -2.7, 2.73

Graph for Example Reciprocal Graph



Exercise 1:

a) Complete the following table for the equation $y = \frac{1}{x}$

x	-4	-3	-2	-1	-0.5	0.5	1	2	3	4
y	-0.25	-0.33		-1	-2		1	0.5		0.25

b) By using a scale of 2 cm to 1 unit on the x-axis and 4cm to 1 unit on the y-axis, draw the graph of $y = \frac{1}{x}$ for $-4 \le x \le 4$

c) From your graph, find the value of y, when x = -2.4

d) Draw a suitable straight line on your graph to find the values of x which satisfy the equation $\frac{1}{x} - x = 1, (x \neq 0)$ for $-4 \le x \le 4$. State the values of x.

Exercise 2:

a) Complete the following table for the equation $y = -\frac{6}{x}$

x	-4	-2.5	-1	-0.6	0.6	1	2	3	4
y	1.5		6	10	-10	-6	-3		-1.5

b) By using a scale of 2 cm to 1 unit on the x-axis and 2cm to 2 unit on the y-axis, draw the graph of $y = -\frac{6}{x}$ for $-4 \le x \le 4$

c) From your graph,

i) find the value of y, when x = 1.3

ii) find the value of x, when y = 3.5

d) Draw a suitable straight line on your graph to find the values of x which satisfy the equation $\frac{3}{x} + 1 = x$ for $-4 \le x \le 4$. State the values of x.

Exercise 3:

a) Complete the following table for the equation $y = \frac{2}{x}$

x	-4	-3	-2	-1	-0.5	0.5	1	2	3	4
y	-0.5	-0.7	-1	-2		4		1	0.7	0.5

b) By using a scale of 2 cm to 1 unit on the x-axis and 2cm to 1 unit on the y-axis, draw the graph of

$y = \frac{2}{x}$ for $-4 \le x \le 4$

c) From your graph,

i) find the value of y, when x = 1.5

ii) find the value of x, when y = -1.8

d) Draw a suitable straight line on your graph to find the values of x which satisfy the equation $2x + 1 = \frac{4}{x}$ for $-4 \le x \le 4$. State the values of x.

Exercise 4:

a) Complete the following table for the equation $y = \frac{4}{x}$

x	-5	-4	-2	-1	-0.5	0.5	0.8	1.5	2.5	5
y		-1		-4	-8	8	5		1.6	

b) By using a scale of 2 cm to 1 unit on the x-axis and 2cm to 2unit on the y-axis, draw the graph of

$y = \frac{4}{x}$ for $-5 \le x \le 5$

c) From your graph,

i) find the value of y, when x = -1.4

ii) find the value of x, when y = 4.4

d) Draw a suitable straight line on your graph to find the values of x which satisfy the equation $\frac{3}{2x} - x = 0$ for $0.5 \le x \le 4$. State the values of x.

Komen Guru :