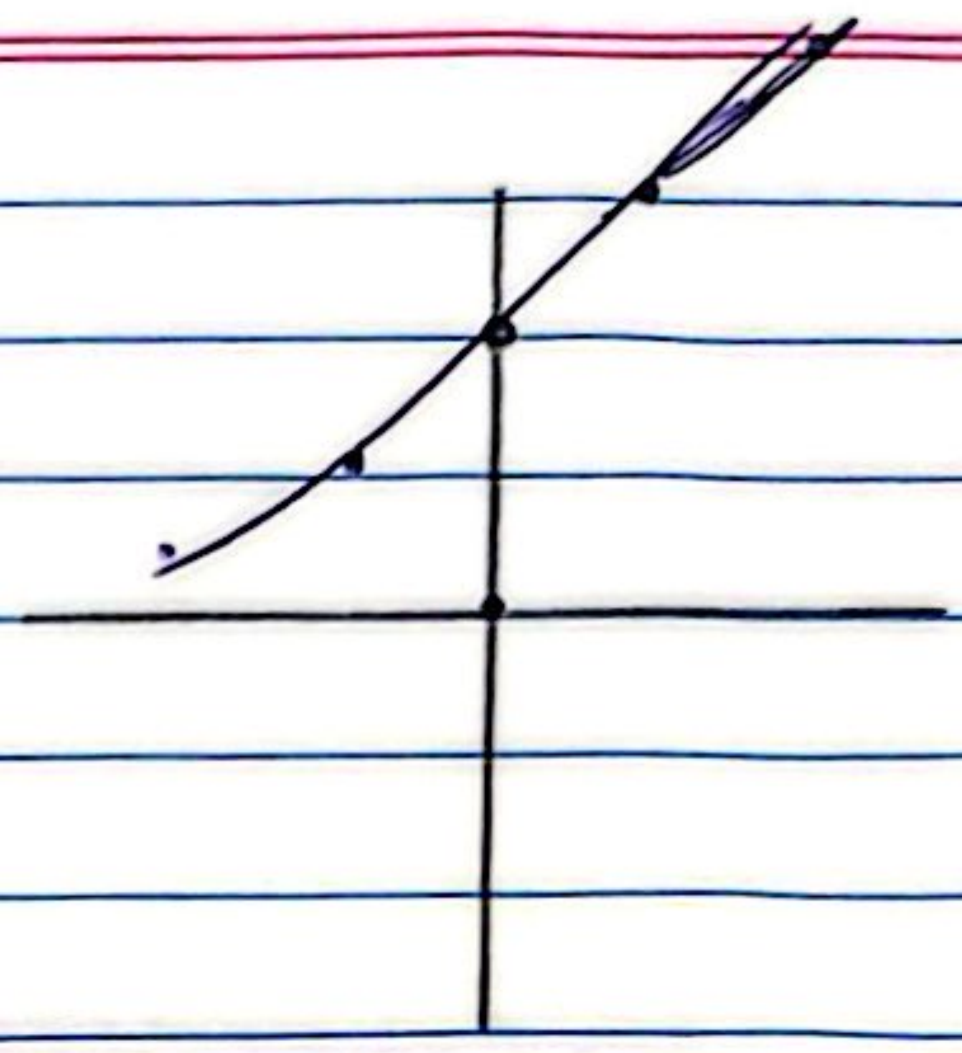
2. $y = x + 3$

x	y
0	3
1	4
2	5
-1	2
-2	1



$D = \{x : x \in R\}$

المدى $\Rightarrow x = y - 3$

المدى $= \{y : y \in R\} = (-\infty, \infty)$

3. $y = x^2 + 3x + 4$

Solu $x^2 + 3x + 4 - y = 0$

$a =$ معامل x^2

$b =$ معامل x

$c =$ الثابت

$\boxed{\text{طريقة المميز } \Delta = b^2 - 4ac \geq 0}$

$\Delta = 9 - 4(1)(4-y) \geq 0$

$\therefore 9 - 4(4-y) \geq 0$

$9 - 16 + 4y \geq 0$

$-7 + 4y \geq 0$

$4y \geq 7 \Rightarrow y \geq \frac{7}{4} =$ المدى

4. $y = \dfrac{x}{x^2+2}$

Solu

$x^2 y + 2y = x$

$y x^2 - x + 2y = 0$

$a = y$

$b = -1$

$c = 2y$

$\Delta = (-1)^2 - 4y\,2y \geq 0$

$1 - 8y^2 \geq 0$

$\therefore y \leq \pm \frac{1}{8}$

$\therefore |y| \leq \frac{1}{2\sqrt{2}}$

$-\frac{1}{2\sqrt{2}} \leq y \leq \frac{1}{2\sqrt{2}}$

المدى $\Rightarrow R = \{y : y \in R\} = [-\frac{1}{2\sqrt{2}}, \frac{1}{2\sqrt{2}}]$

5. $y = \frac{2x-1}{x^2-9}$

Sol/

$yx^2 - 9y = 2x - 1$ $\qquad a = y$

$yx^2 - 2x + 1 - 9y = 0$ $\qquad b = -2$

$c = 1 - 9y$

$\Delta = (-2)^2 - 4y(1-9y) \geq 0$

$4 - 4y + 36y^2 \geq 0$

$4(1 - y + 9y^2) \geq 0$

6. $f(x) = 4 + 5\cos x = y$

مدى دالة cos $(-1,1)$

Solu

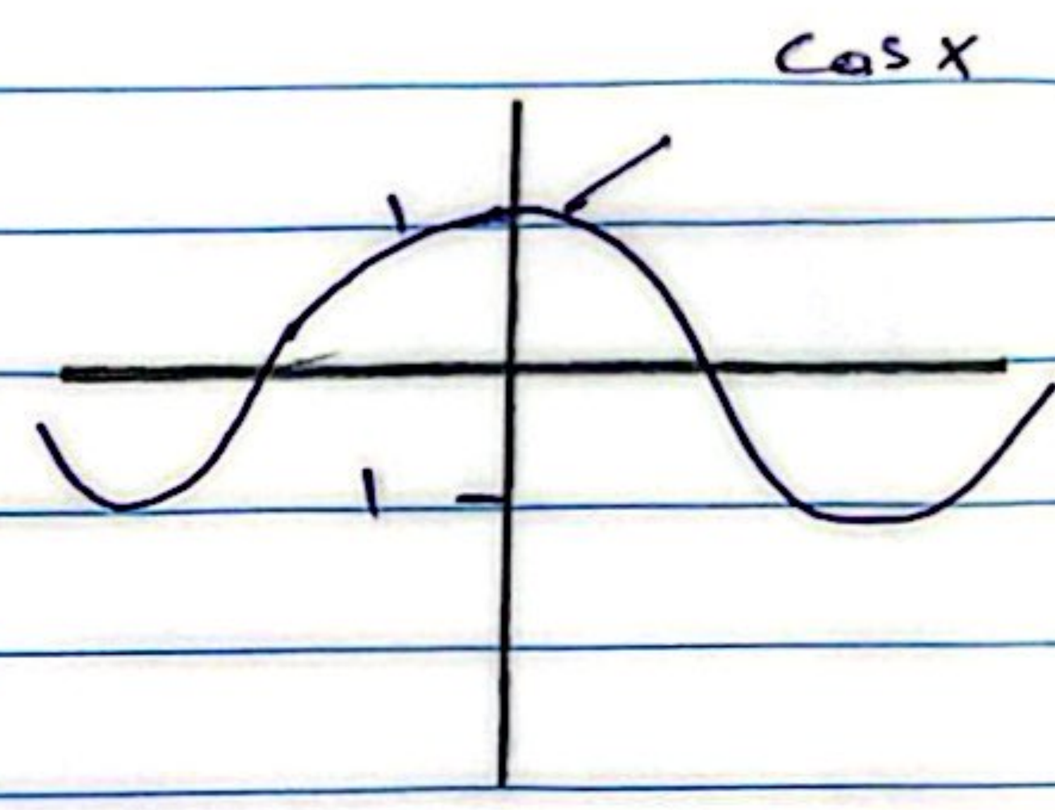
$$-1 \le \cos x \le 1 \qquad * 5$$

$$-5 \le 5\cos x \le 5 \qquad + 4$$

$$-5+4 \le 4+5\cos x \le 5+4$$

$$-1 \le \underbrace{4+5\cos x}_{y} \le 9$$

$$-1 \le y \le 9$$



المدى $= [-1, 9]$

7. $y = 1 + \cos x \quad ; \; x \in [0, \frac{\pi}{2}]$

Solu

$$0 \le x \le \frac{\pi}{2}$$ نأخذ cos للمتباينة

$$\cos 0 \le \cos x \le \cos \frac{\pi}{2}$$ $=90$

لأنها متناقصة تقلب الإشارة

$$1 \ge \cos x \ge 0$$

$+1$

$$2 \ge 1 + \cos x \ge 1$$

$$2 \ge y \ge 1$$

المدى $\Rightarrow R = \{x : x \in R\} = [1, 2]$

7. $y = -3 + \sin^2 x$

Solu

المدى للدالة $\sin$ $(-1,1)$

$$-1 \le \sin x \le 1$$

بتربيع الطرفين

$$0 \le \sin^2 x \le 1$$

-3

$$-3 \le -3 + \sin^2 x \le 1 - 3$$

$$-3 \le -3 + \sin^2 x \le -2$$

$$-3 \le y \le -2$$

المدى $\Rightarrow R = \{x : x \in R\} = [-3, -2]$

H.w.

$$f(x) = \frac{1}{\sqrt{\sin^2 x + 1}}$$

Solu

ا د يجاد الدالة

تربيع الطرفين

$$-1 \le \sin x \le 1$$

اضافة ١

$$0 \le \sin^2 x \le 1$$

$$0 + 1 \le \sin^2 x + 1 \le 1 + 1$$

اخذ الجذر التربيعي

$$1 \le \sin^2 x + 1 \le 2$$

$$\sqrt{1} \le \sqrt{\sin^2 x + 1} \le \sqrt{2}$$

قلب المتباينة

$$1 \geq \frac{1}{\sqrt{\sin^2 x + 1}} \geq \frac{1}{\sqrt{2}}$$

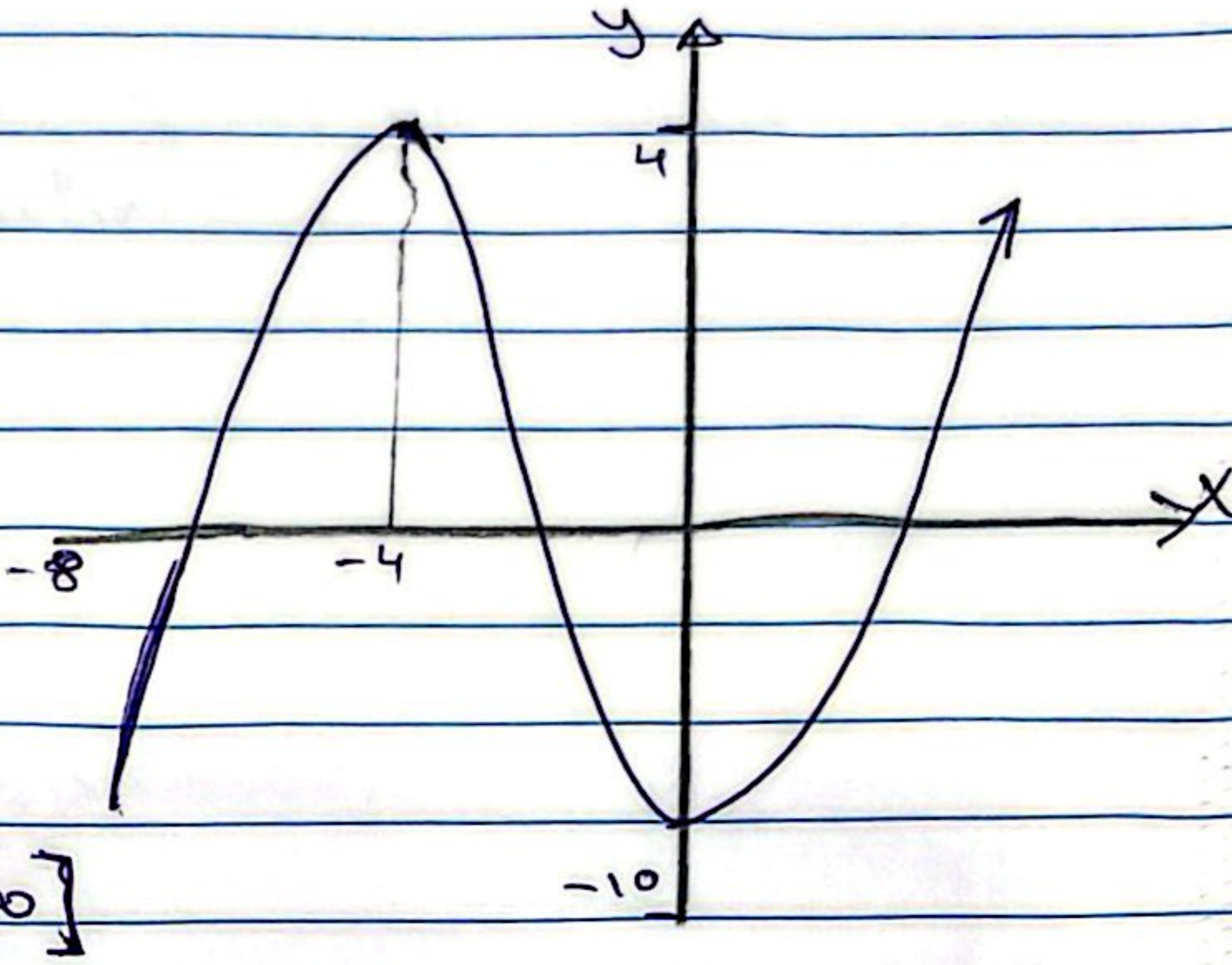
$$1 \geq y \geq \frac{1}{\sqrt{2}}$$

المدى $\Rightarrow R = \{x : x \in R\} = \left[\frac{1}{\sqrt{2}}, 1\right]$

[الصغير ، الكبير]

H.W. Find the Range and Domain to the Fighers

1.



$D = [-8, -4) \cup (-4, \infty)$

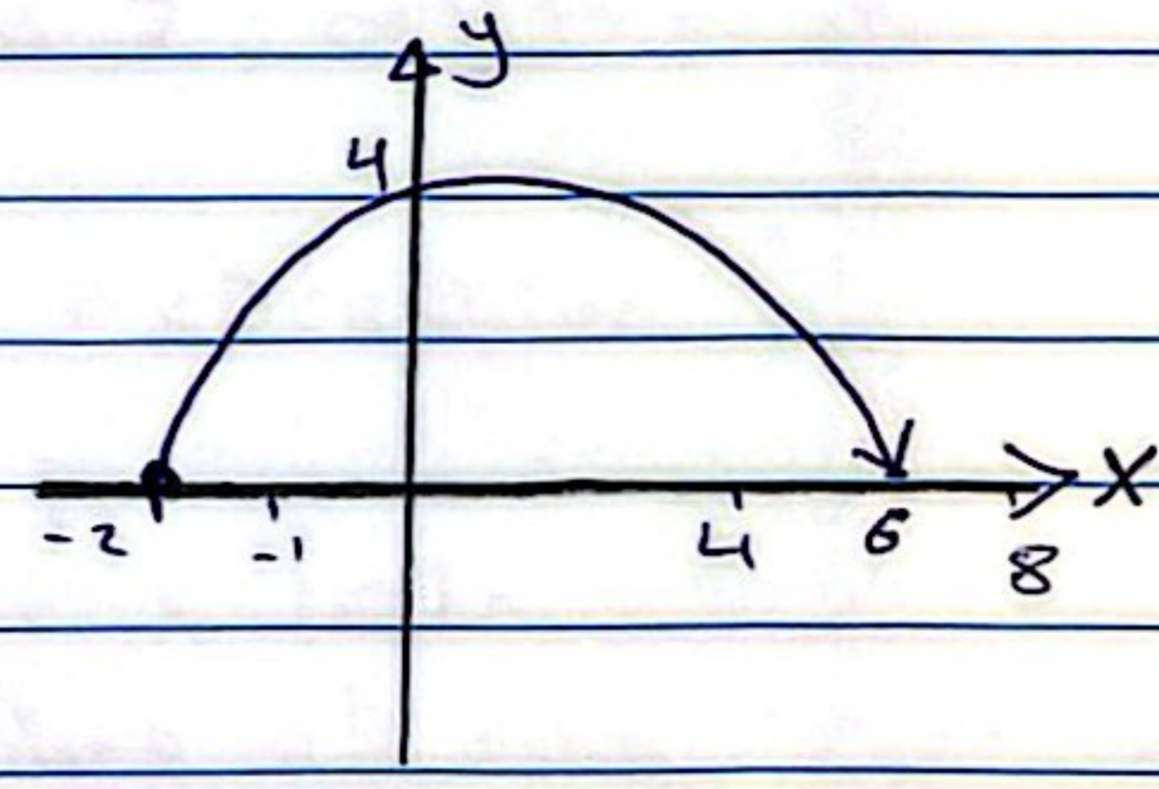
or

$D = \{x : x \in R ; x \geq -\infty\}$

$x \neq -4$

$R = \{y : y \in R\} = [-10, \infty]$

2.



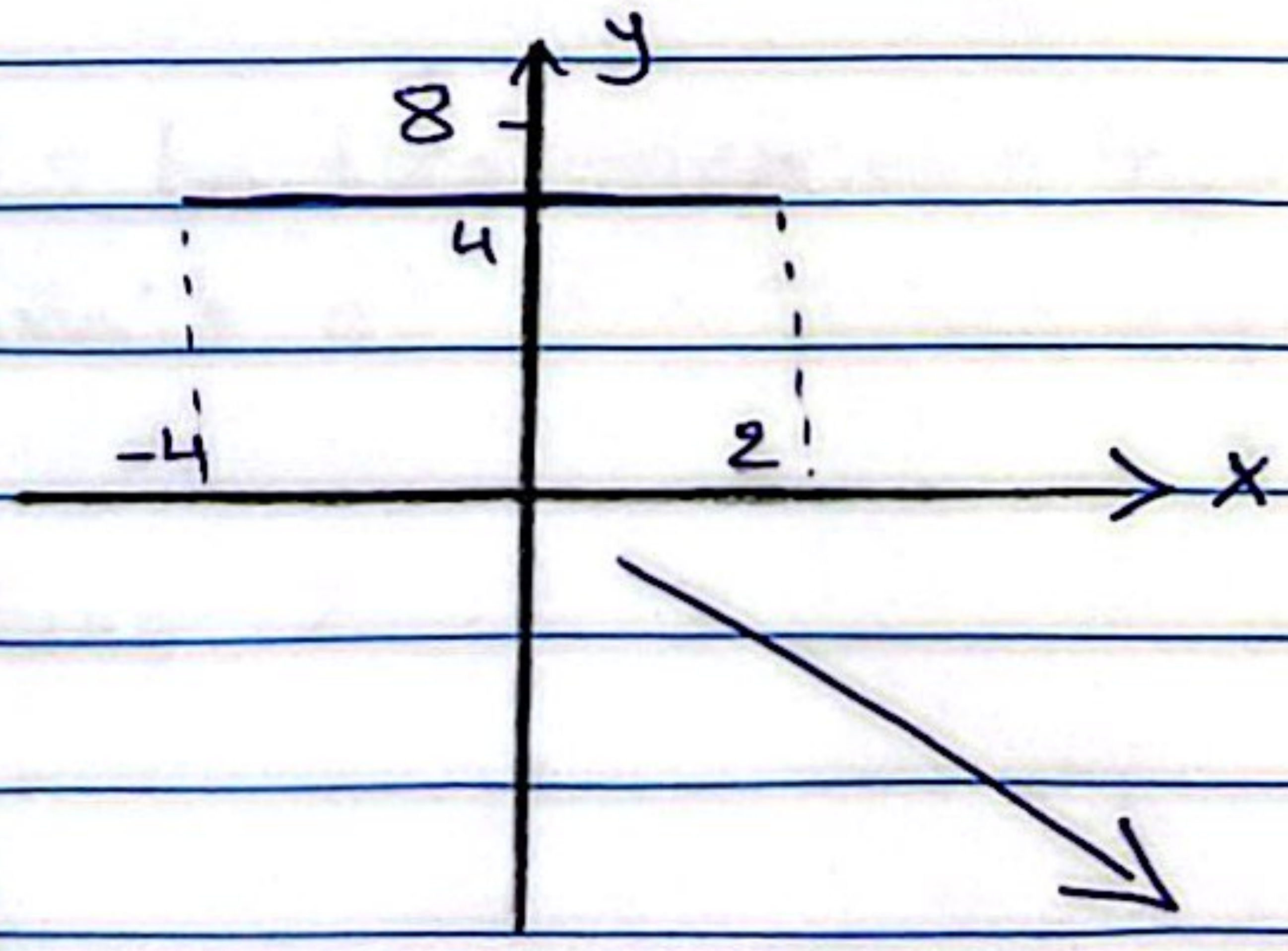
$D = \{x : x \in R\} = [-2, 6]$

or

$D = [-2, 6)$

$R = \{y : y \in R\} = [0, 4]$

3.



$D = \{x : x \in R ; x > -4 ; x \neq 2\}$

or $D = (-4, \infty) \cup (2, \infty)$

$R = \{y : y \in R ; y < -2 ; y = 6\}$

الحل $= (-\infty, -2) \cup (6)$

limits

To explain the limit of goals, we consider the following mathematical definition:-

$f: R \to R$

let have the function

$f(x) = x^2 - 1 \quad ; x \in R$

we want to know what happens to the value of the function $f(x)$, when we give values for x that are very close to 2 on both sides that is, we give values of x are a little less than 2, a little more than 2, and so on.
This is what is meant by the expression "very close to 2" from both sides.
When we substitute values for x into the function we get the result that the value of the function is very close to the number 2.

The closer the value of x is to the number 2, that is, we can say that the limit of the function:-

$f(x) = x^2 - 1$ in the number 2 is 3

That is : $f(2) = 2^2 - 1 = 3$

The limits are divided into three sections:-

The limits are :-

1. The real number

The limit approaches L when x approaches to a:

That is:

$$\lim_{x \to a} f(x) = L$$

If the value of x approaches any real number, then the substitution is made directly with the same value

This is: $f(x)_{x \to a} = L$

Ex1. Find $\lim_{x \to 2} x^3 + 4x$

solu $\lim_{x \to 2} x^3 + 4x$.

$$= (2)^3 + 4(2) = 8 + 8 = 16$$

So that the limit of the function $\lim_{x \to 2} x^3 + 4x$ when x approaches 2 is 16

2. $\lim_{x \to 2} \frac{x^2 - 4}{x - 2}$

١. التعويض

Solu

$$= \frac{4-4}{2-2} = \frac{0}{0}$$

كمية غير معرفة

$\frac{0}{1} = 0$

$\frac{1}{0} = \infty$

٢. التبسيط

$$\therefore \lim_{x \to 2} \frac{(x-2)(x+2)}{x-2}$$

$$= \lim_{x \to 2} (x+2) = \underline{\underline{4}}$$

3. $\lim_{x \to 1} \frac{x^2+x-2}{x^2-x}$

١. التعويض

$\frac{1+1-2}{1-1} = \frac{0}{0}$

٢. التبسيط

حلل بالتجزئة

$= \lim_{x \to 1} \frac{(x+2)(x-1)}{x(x-1)}$

$= \lim_{x \to 1} \frac{x+2}{x}$

$= \frac{3}{1} = 3$

4. $\lim_{x \to 2} \frac{x^3-8}{x-2}$

Solu

$\frac{8-8}{2-2} = \frac{0}{0}$ لا يجوز

$\therefore = \lim_{x \to 2} \frac{(x-2)(x^2+2x+4)}{(x-2)}$

$= \lim_{x \to 2} (x^2+2x+4)$

$= 2^2 + 2(2) + 4 = 12$

5. $\lim_{x \to -1} \frac{1}{x^2+2}$

Solu

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

So that the limit of the function $\lim_{x \to -1} \frac{1}{x^2+2}$ when x approaches -1 is $\frac{1}{3}$.