Graph of the functions

The graph of a function is a collection of points (x, f(x)), where x is an input value and f(x) is the corresponding output value.

Remark:

Let $f: A \to B$ be a function, the graph of the function f is the set

$$G = \{(x, y): f(x) = y\}$$

For example, if we have the function $f(x) = x^2$, the graph will consist of points.

To plot a graph of a function

For x = -2, $f(-2) = (-2)^2 = 4$ x = -1, $f(-1) = (-1)^2 = 1$ x = 0, f(0) = (0) = 0 x = 1, $f(1) = (1)^2 = 1$ x = 2, $f(2) = (2)^2 = 4$

Then you plot these points (-2,4), (-1,1), (0,0), (1,1), (2,4)



Example:

Let f(x) = x, find the graph of f where $-5 \le x \le 5$



Example:

Let $f(x) = \sqrt{x}$, find the graph f where $x \ge 0$.



<u>H.W</u>

Graph the function

 $1_f(x) = x^2 + 4$ $2_f(x) = x^3 + 1$ $3_f(x) = x^4 + 2x + 1$

Some kinds of function.

• Linear function

A linear function has the form: f(x) = mx + b, where mis the slope and b is the y-intercept. It represents a straight line when graphed. For example, f(x) = 5x - 1



Quadratic Function

A quadratic function has the form: $f(x) = ax^2 + bx + c$ where a, b, and c are constants. It forms a parabola when graphed.

For example, $f(x) = x^2 + 4$



• Identity Function

The identity function is the simplest type of function f(x) = x, It simply returns the input as the output.



Constant Function

A constant function returns the same value no matter what the input is: f(x) = c where c is a constant.

For example, f(x) = 4.



Polynomial Function

A polynomial function is a sum of terms, each consisting of a constant multiplied by a variable raised to a non-negative integer power.

$$f(x) = a_n x^n + a_{n-1} x^{n-1} + \dots + a_1 x + a_0$$

where *n* is a non-negative integer and *a* non-negative integer and $a_n \neq 0$. For example, $f(x) = x^4 + 2x + 1$.

