ABSOLUTE VALUE
FUNCTIONS AND
GRAPHS
UNIT 02 LESSON 05
OBJECTIVES

STUDENTS WILL BE ABLE TO:

Understand how to solve and sketch Absolute Value Functions and Graphs

KEY VOCABULARY:

• Absolute Value Functions and Graphs
• Write absolute value function
• Sketch the graphs from a given absolute value function
ABSOLUTE VALUE FUNCTIONS AND GRAPHS

ABSOLUTE VALUES

‘Absolute value’ means to remove any negative sign in front of a number, and to think of all numbers as positives (or zero)

OR

“the magnitude of a real number without regard to its sign”
ABSOLUTE VALUE FUNCTIONS AND GRAPHS

REPRESENTATION OF ABSOLUTE VALUES

We put “|” marks either side called bars e.g

\[ | -9 | = 9 \text{ and } | 7 | = 7 \]
ABSOLUTE VALUE FUNCTIONS AND GRAPHS

• Absolute value function has a V-shaped graph.

• If we have $|x|$, it will give the value of $x$ as

$$|x| = \begin{cases} 
  x, & x \geq 0 \\
  -x, & x < 0 
\end{cases}$$

• The graph is sketched as

  o Step I: sketch the graph for $y=f(x)$
  o Step II: Reflect in the x-axis that part of the graph below the x-axis.
ABSOLUTE VALUE FUNCTIONS AND GRAPHS

GENERAL FORM OF GRAPHS

\[ y = |x - 2| - 4 \]
\[ y = |x - 2| - 4 \]

\[ y = |x + 1| \]
\[ y = |x + 1| \]
Problem 01

Solve the equation

\[ |x + 1| = 2x - 5 \]

Once the absolute value signs are removed, \( \pm \) is added

\[ x + 1 = \pm (2x - 5) \]

\[ x + 1 = + (2x - 5) \]
\[ x - 2x = -5 - 1 \]
\[ -x = -6 \]
\[ x = 6 \]

\[ x + 1 = - (2x - 5) \]
\[ x + 2x = 5 - 1 \]
\[ 3x = 4 \]
\[ x = \frac{4}{3} \]
PROBLEM 02

Sketch the graph using following equation

\(|x| + 2\)
PROBLEM 02

Sketch the graph using following equation

\[ |x| + 2 \]
PROBLEM 03
If \( f(x) = |x - 2| \) find \( f(-5) \)

Now to find the value of \( f(-5) \), we need to put the value of \( x \) as -5.

\[
f(-5) = |-5 - 2| \\
= |-7| \\
= 7
\]