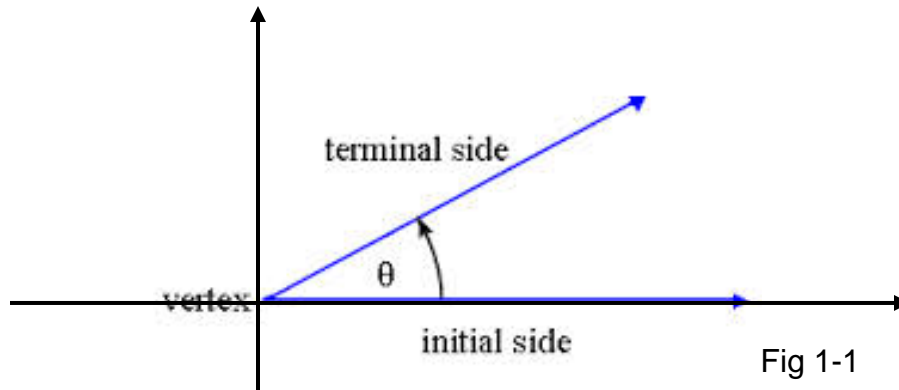


# Angles and Degree Measure

## Introduction:

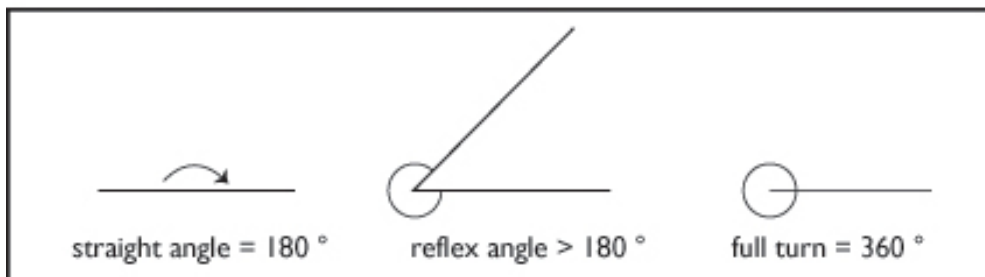
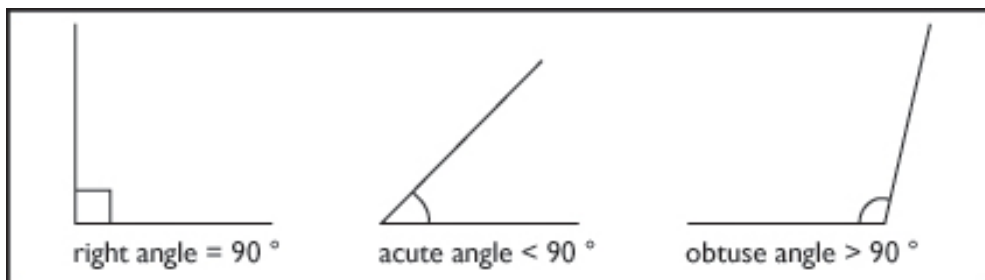
An angle has three parts: an **initial ray**, a **terminal ray**, and a **vertex** (the point of intersection of the two rays), as shown in Figure 1.1.

An angle is in **standard position** if its initial ray coincides with the positive x-axis and its vertex is at the origin.



## Types of angles:

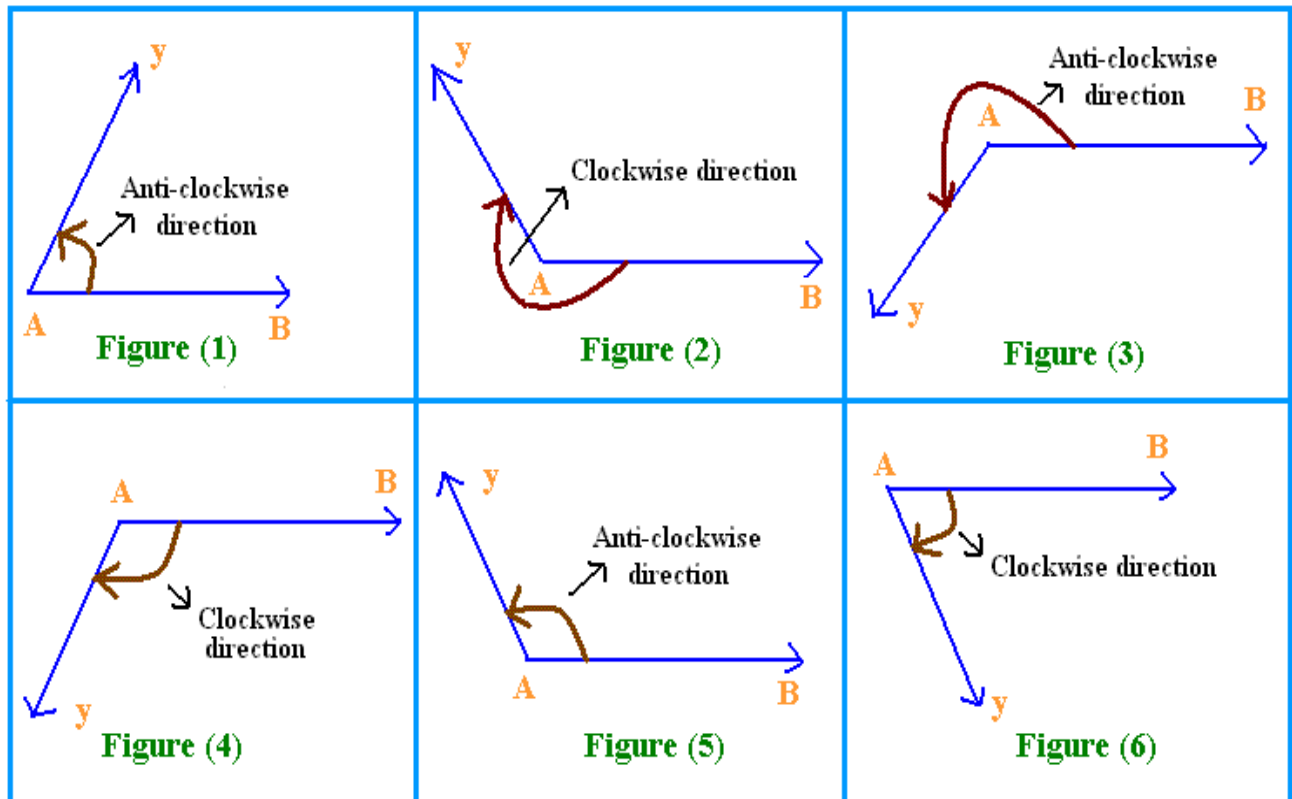
- Angles between 0 and 90 degrees ( $0^\circ < \theta < 90^\circ$ ) are called **acute angles**.
- Angles between 90 and 180 degrees ( $90^\circ < \theta < 180^\circ$ ) are known as **obtuse angles**.
- Angles that are 90 degrees ( $\theta = 90^\circ$ ) are **right angles**.
- Angles that are 180 degrees ( $\theta = 180^\circ$ ) are known as **straight angles**.
- Angles between 180 and 360 degrees ( $180^\circ < \theta < 360^\circ$ ) are called **reflex angles**.
- Angles that are 360 degrees ( $\theta = 360^\circ$ ) are full turn.



# Angles and Degree Measure

**Positive angles** are measured counterclockwise (anti-clockwise), and **negative angles** are measured clockwise.

For instance, Figure 1.3 shows an angle whose measure is  $\theta$ . You cannot assign a measure to an angle by simply knowing where its initial and terminal rays are located. To measure an angle, you must also know how the terminal ray was revolved (i.e. in which direction).



## Review Question:

Referring to the diagram above, which figures show positive angles? Which figures show negative angles?

## Answer:

Figures (1), (3), and (5) show positive angles.

Figures (2), (4), and (6) show negative angles.