

## **Clocks Formulas and Concepts:**

Here are some formulas, concepts, and short related to clocks that are commonly used in quantitative aptitude exams:

### **Minute Spaces:**

A typical analog clock has a circular face with twelve-hour markings, and 60-minute markings placed around the circumference of the circle, called minute spaces.

- When it comes to telling time, clocks use two primary hands: the hour hand and the minute hand.
- Hour hand, also known as the shorthand, is typically smaller and moves more slowly than the minute hand.
- Meanwhile, the larger, faster-moving hand is called the minute hand or long hand.
- The markings on the face of a clock are 60 spaces, one each for a minute. Every hour, the minute hand completes one round of 60 spaces and the hour hand completes one full round every 12 hours.

### **Important Points and Shortcuts for Clock:**

- In 60 minutes, the minute hand gains 55 spaces (also known as minute spaces) over the hour hand. For example, if the initial time is 12:00, then after 1 hour, the minute hand would cover 60 spaces whereas the hour hand would cover only 5 spaces. Thus, the minute hand covers 55 spaces extra than the hour hand.
- The minute hand covers 360 degrees in 60 minutes.  $\Rightarrow$  In 1 minute, the minute hand covers  $360 / 60 = 6$  degrees
- The hour hand covers 360 degrees in 12 hours.  $\Rightarrow$  In 1 hour, the hour hand covers  $360 / 12 = 30$  degrees  $\Rightarrow$  In 1 minute, the hour hand covers  $30 / 60 = 0.50$  degrees
- The angle between the minute hand and the hour hand increases by 5.50 degrees every minute. For example, after 2 minutes, angle made by the minute hand  $= 2 \times 6 = 12$  degrees and angle made by the hour hand  $= 2 \times 0.50 = 1$  degree  $\Rightarrow$  Angle between the hour hand and the minute hand after 2 minutes  $= 12 - 1 = 11$  degrees  $= 2 \times 5.50$  degrees
- In every hour, the minute hand and the hour hand coincide once.
- If the minute hand and the hour hand are in the same line, then the angle between them is either 0 degree or 180 degrees.

- The angle between the minute hand and the hour hand is 180 degrees if they are 30 spaces apart, 90 degrees if they are 15 spaces apart, and 0 degrees if they are 0 spaces apart.
- If the clock shows time ahead of the actual time, it is said to be running fast. For example, if the clock is showing 12:15 PM but it is actually 12:00 PM, then the clock is said to be running 15 minutes fast.
- If the clock shows time behind the actual time, it is said to be running slow. For example, if the clock is showing 2:15 PM but it is actually 2:30 PM, then the clock is said to be running 15 minutes slow.