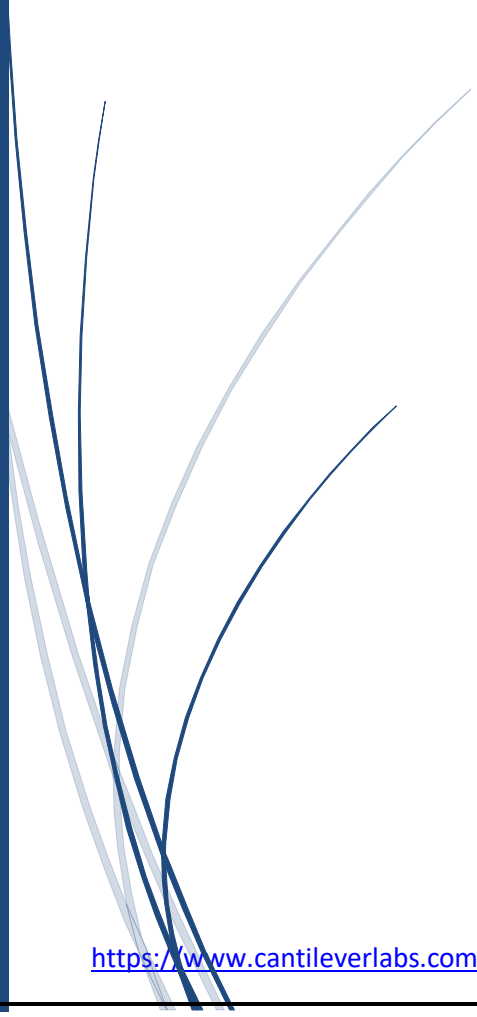
Knowledge Card

Aptitude|Clock



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Clock

A clock is an instrument to measure time. It is meeting the need to measure intervals of time.

Clocks Formulas

1. Minute Spaces: The face or dial of clock is a circle whose circumference is divided into 60 equal parts, named minute spaces.
2. Hour hand and minute hand: The smaller hand of a clock is called the hour hand or shorthand and the larger hand (instead of one) is called minute hand or long hand.

More Clocks Formulas

Formula for Clocks 1:

When the minute hand is behind the hour hand, the angle between two hands at M minutes past H ‘o clock will be
30(H-(M/5)) + (M/2)degree.

Formula for Clocks 2:

When the minute hand is behind the hour hand, the angle between two hands at M minutes past H ‘o clock will be
30(H-(M/5)) + (M/2)degree.

Important Observations and Formulas of Clock:

- A clock is a complete circle having 360 degrees. It is divided into 12 equal parts i.e., each part is 360/12 = 30.
- As the minute hand takes a complete round in one hour it covers 360 degrees in 60 min. Minute Hand covers 360/60 = 6 degree/ minute.
- Also, as the hour hand covers just one part out of the given 12 parts in one hour, this implies Hour Hand covers 300 in 60 min. i.e. 1/2 degree per minute. Therefore, the relative speed of the minute hand is 6 – (1/2) = 5(1/2) degrees.
- Every hour, both the hands coincide once. In 12 hours, they will coincide 11 times. It happens due to only one such incident between 12 and 1’o clock.
- The hands are in the same straight line when they are coincident or opposite to each other.
- When the two hands are at a right angle, they are 15-minute spaces apart.
- In one hour, they will form two right angles and in 12 hours there are only 22 right angles. It happens due to right angles formed by the minute and hour hand at 3’o clock and 9’o clock.
- When the hands are in opposite directions, they are 30-minute spaces apart.

- If a clock indicates 9.15, when the correct time is 9, it is said to be 15 minutes too fast. On the other hand, if it indicates 8.45, when the correct time is 9, it is said to be 15 minutes too slow.
- If both the hour hand and minute hand move at their normal speeds, then both the hands meet after 65(5/11) minutes.
- 22 times in a day, the hands of a clock will be in a straight line but opposite in direction.
- 44 times in a day, the hands of a clock will be straight.
- 44 times in a day, the hands of a clock are at right angles.
- 22 times in a day, the hands of a clock coincide.

How to Solve Clock Questions Quickly

Question 1.

Calculate the angle between the two hands of a clock when the time shown by the clock is 5: 30 a.m?

A. 100

B. 150

C. 200

D. None of the above

Solution

According to the formula

Angle = (11/2)M – 30H, where M =30, and h =5

= (11/2) x 30 – 30 x 5

= |165 – 150|, taking the mode of the values, we get

= 15°

Correct Option: B

Question 2.

How many degrees will the minute hand move, in which the second hand moves 480?

A. 4°

B. 8°

C. 10°

D. 12°

Solution

In 480 seconds, the minute hand will cover = 480/60 = 8°

Therefore, minute hand moves for 8° when the second hand has moved 480 .

Correct Option: B

Question 3.

A clock is started in the afternoon. By 10 minutes past 5, the hour hand has turned through how many degrees?

A. 134°

B. 148°

C. 135°

D. 155°

Solution

Angle traced by hour hand in 12 hrs = 360°.

Angle traced by hour hand in 5 hrs 10 min = 5*60 + 10 = 310 = 310/60 = 31/6 hrs

= 360/12 * 31/6

= 155°

Correct Option: D

Clocks: Tips and Tricks and Shortcuts

Type 1: Tips and Tricks for Clocks Questions

Question 1.

What is the angle between the minute hand the hour hand when the time is 4:30.

A. 350

B. 100

C. 200

D. None of the above

Correct Option: A

Solution:

Tip: It is easy to calculate the angle between the minute and the hour hand by using a simple formula,

Angle = (X*30)-((Y*11)/2)

Multiplying hours with minutes, we get = 4 x 30 = 120

Applying the formula, we get (Yx11)/2

= 30 x 11/ 2

= 165

When we subtract the two values, we get,

= 165 – 130

= 350

Type 2: Tips and Tricks for Clocks

Question 2.

Calculate the time between 6 and 7 o'clock when the hands of a clock are in the same straight line but are not together?

A. 65.45 min past 6

B. 60 minutes past 6

C. 50 minutes past 6

D. Cannot be determined

Correct Option: A

Solution:

Tip: You can use a short formula to calculate the time when the angle is given

Angle = (minutes) -30 (hours)

Using the above formula, we get

180 = (minutes) -30 (hours)

180= (minutes) – 30 (6)

180 + 180 = minutes

Minutes = 2 x 360/ 11

= 65.45