**QUESTION :**

We all know that the hour hand and the minute hand on a clock travel at different speeds. However, there are certain occasions when they are exactly opposite each other. Can you give a simple formula for calculating the times of these occasions?

**ANSWER :**

First Hand X = 12Y

Second Hand X = 12Y – 5

Third Hand X = 12Y - 10

**STRATEGY :**

Here is the formula that gives the minutes past twelve to which the hour hand points when the minute hand is exactly thirty minutes ahead.

Minutes past twelve Y = 30/11 [(n-1) 2+1]

where n is the next hour.

Lets take the case of at what time between 4 and 5 will the hands be opposite each other? (n=5).

i.e Y = 3/11 X 9 = 270/11 + 24 6/11.

i.e the hour hand will be 24 6/11 minutes past 4.

The formula may be derived from the following.

If X is distance moved by the minute hand.

Y is the distance moved by our hand

Then X – Y = 30

First time the Hands move round X = 12Y

Second time the Hands move round X = 12Y – 5

Third time the Hands move round X = 12Y – 10

And so on.