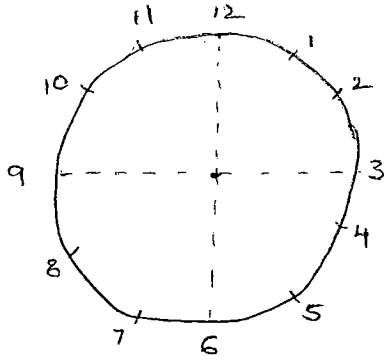
CLOCKS



60 min = 360°

1 min = 6°

12 hours = 360°

1 hour = 30°

↓

60 min = 30°

1 min = $\frac{1}{2}$°

The difference between minutes and hours are

$= 6 - \frac{1}{2} = 5\frac{1}{2}° = \frac{11}{2}°$

1. In a clock of 12 hours the minutes hand and hours hand are coincide into each other. the angle between them is 0° is in 11 times.

2. In a clock of 12 hours the minutes hand and hours hand are in opposite direction i.e., the angle between them is 180° is in 11 times ⟷

3. In a clock of 12 hours the minutes hand and hours hand are pendicular to each other that is the angle between them is 90° is in 22 times. ↑→

4. $\boxed{\theta = \frac{11}{2}m - 30h}$, if $\frac{11}{2}m > 30h$

θ = the angle between the minute hand and hour hand

m = minutes

h = hours

$\boxed{\theta = 30h - \frac{11}{2}m}$, if $\frac{11}{2}m < 30h$

Ex:- What is the angle between minutes and hours hand of a clock at 4 hr 30m.

A. $\theta = \frac{11}{2}m - 30h$

$= \frac{11}{2}(30) - 30(4)$

$= 165 - 120$

$= 45^\circ$

Ex:- What is the angle between the two hands of a clock when the clock shows 3 hours 25 minutes

A. $\theta = \frac{11}{2}m - 30h$

$= \frac{11}{2}(25) - 30(3)$

$\theta = 47\frac{1}{2}^\circ$

Ex:-) At what tyime between 6 and 7°C are the hands of a clock together.

A. $\theta = \frac{11}{2}m - 30h$

@ Both hands together (coincides) means $\theta = 0^\circ$

$0 = \frac{11}{2}m - 30(6)$

$m = 32\frac{8}{11}$

$\therefore$ @ 6 hours $32\frac{8}{11}$ min both hands are coincide.

Ex:- A what time between 3 and 4°C are the hands of a clock in the opposite direction

A. Opposite direction, $\theta = 180^\circ$

$\theta = \frac{11}{2}m - 30h$

$180^\circ = \frac{11}{2}m - 30(3)$

$m = 49\frac{1}{11}$

@ 3 hours $49\frac{1}{11}$ min.