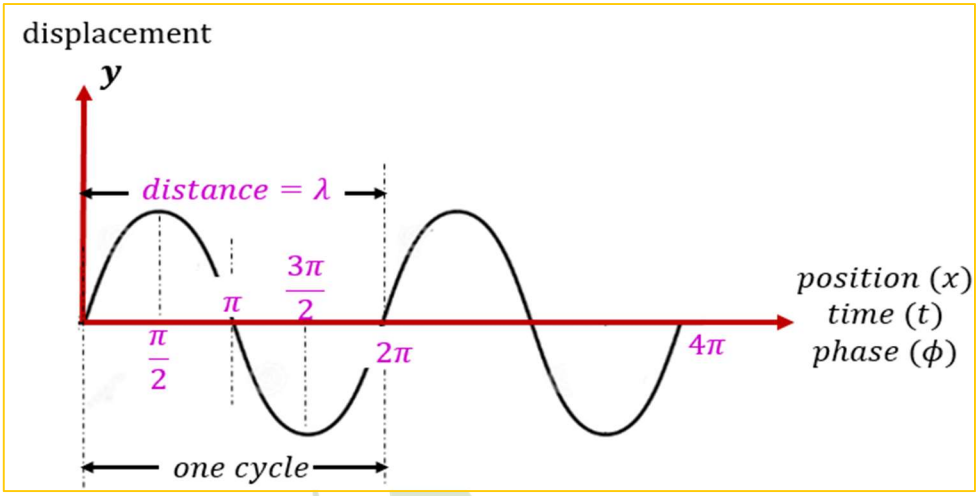
Relation between Phase difference and path difference:



$For\ path\ difference\ \lambda,\quad phase\ difference = 2\pi$

$For\ path\ difference\ 1,\quad phase\ difference = \frac{2\pi}{\lambda}$

$For\ path\ difference\ x,\quad phase\ difference = \frac{2\pi}{\lambda}x$

Hence, $\boldsymbol{phase\ difference = \frac{2\pi}{\lambda} \times path\ difference}$

NB:

Phase difference between two different points (particles) at same time: $\Delta\phi = k\,\Delta x$; $\Delta x = x_2 - x_1$

Phase difference of same point (particle) at different time: $\Delta\phi = \omega\Delta t$; $\Delta t = t_2 - t_1$

1. The distance between two points differing in phase by 60^o on a wave having wave velocity $360\ m/s$ and frequency $500\ Hz$ is:
   a) $0.72\ m$ b) $0.36\ m$ c) $0.18\ m$ d) $0.12\ m$
2. A wave of frequency $500Hz$ is travelling at a speed of $350\ m/s$. By how much the phase of a particle change in 10^{-3} seconds?
   a) π b) 180^o c) only (a) d) both (a) and (b)