Consider the superposition of a direct ray, #1 and a reflected ray, #2 at $P$, where reflection is by a mirror at $A$.

Find $k \Delta$ values which lead to maxima.

A) $k \Delta = \pi, \ 3\pi, \ 5\pi \ldots$

B) $k \Delta = 0, \ 2\pi, \ 4\pi \ldots$

\[ \phi = \phi_{path} + |\phi_{refl1} - \phi_{refl2}|. \]

For the present set up, $\phi_{path} = k \Delta$. The phase angle contributed by the reflection is: $|0 - \pi| = \pi$. So maxima occur where the phase angle is:

\[ \phi = 0, \ 2\pi, \ 4\pi, \ldots = k \Delta + \pi. \]

In other words $k \Delta = \pi, \ 3\pi, \ 5\pi \ldots$

Answer A.

37.05-01 `Direct Ray` and `Reflected Ray` 2004-3-24