

## DEFINITIONS FOR INTERFERENCE

For waves from two sources, arriving at location  $\underline{r}$ , the PATH DIFFERENCE is the absolute value of the difference between the distance of travel for wave one to location  $\underline{r}$  and the distance of travel for wave two to location  $\underline{r}$ .

CONSTRUCTIVE INTERFERENCE occurs for two waves arriving at location  $\underline{r}$  when those two waves are always IN PHASE at  $\underline{r}$ .

For in-phase sources, the path difference to location  $\underline{r}$  for the two sources must be a whole number of wavelengths.

DESTRUCTIVE INTERFERENCE occurs for two waves arriving at location  $\underline{r}$  when those two waves are always  $180^\circ$  OUT OF PHASE at  $\underline{r}$ ; the destructive interference is complete if the two waves also have the same amplitude. For in-phase sources, the path difference to location  $\underline{r}$  for the two sources must be an odd number of half wavelengths.

A NODE is created by interfering waves at any point of continuous complete destructive interference.

An ANTINODE is created by interfering waves at any point of continuous constructive interference.