Solution

Light interfering from 10 equally spaced slits initially illuminates a screen. Now we double the number of slits, keeping the spacing constant.

1. What happens to the intensity I at the principal maxima?

a. stays same (I) b. doubles (2I) **c. quadruples (4I)**

$I_N = N^2 I_1$. $10 \rightarrow 20$ means $100 \rightarrow 400$.

2. What happens to the net power on the screen?

a. stays same **b. doubles** c. quadruples

If we double the number of slits, we expect the power on the screen to double. How does this work?

- The number of principal maxima (which have most of the power) does *not* change.
- The principal maxima become 4x brighter.
- But they also become only half as wide.
- Therefore, the net power (integrating over all the peaks) increases two-fold, as we would expect.