

C8COHINTS

Graphs for demonstration of the intensity of the superposition of two waves when integrating over a wavelength interval.

The medium wavelength is $\lambda_m = 2$. A phase difference of δ in the x coordinate is studied for 0, 1/2 and 1 medium wavelength.

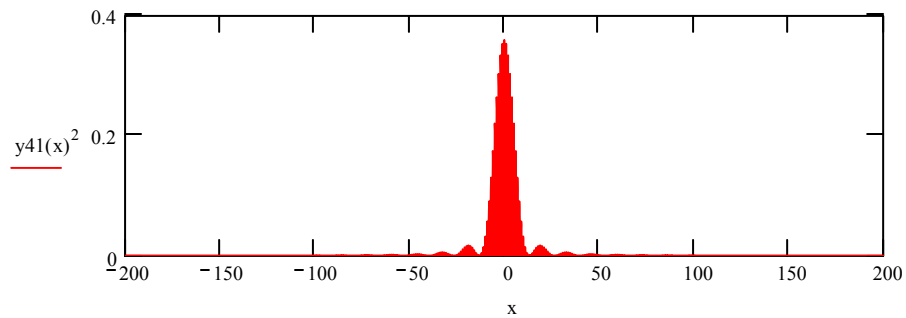
$$x := -200, -199.9..200 \quad \lambda_m \equiv 2$$

$$a1 \equiv 0$$

$$\delta1 := \lambda_m \cdot a1$$

1. Integration over the wavelength interval from 1.85 to 2.15 for the intensity superposition of two of the waves, **no phase difference, using $\delta1 = \lambda_m \cdot a1$** , where λ_m is the medium wavelength .

$$y41(x) := \int_{1.85}^{2.15} \cos\left(2 \cdot \pi \cdot \frac{x - \delta1}{\lambda}\right) + \cos\left(2 \cdot \pi \cdot \frac{x}{\lambda}\right) d\lambda \quad \text{TOL} := .1$$



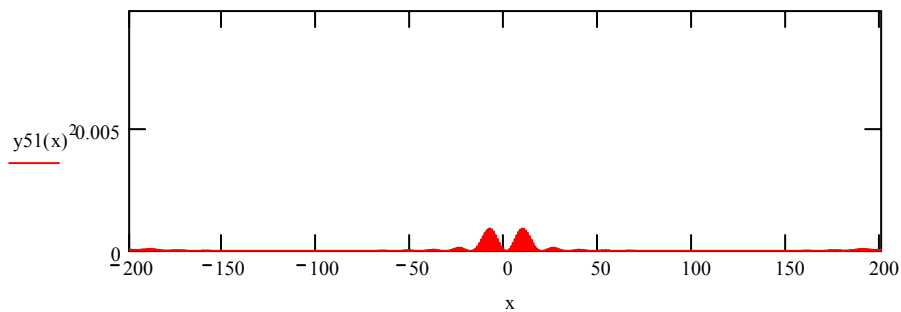
2. Integration over the wavelength interval from 1.85 to 2.15 for the intensity superposition of two waves, for **phase difference**, using $\delta = \lambda m \cdot a_2$.
The phase difference is $(1/2) \lambda m$

$$y_{51}(x) := \int_{1.85}^{2.15} \cos\left(2 \cdot \pi \cdot \frac{x - \delta_2}{\lambda}\right) + \cos\left(2 \cdot \pi \cdot \frac{x}{\lambda}\right) d\lambda$$

$$a_2 \equiv .5$$

$$\delta_2 \equiv \lambda m \cdot a_2$$

We have to use an expanded scale to see the result



3. Integration over the wavelength interval from 1.85 to 2.15 for the intensity superposition of two waves, for **phase difference**, using $\delta_3 = \lambda m \cdot a_3$.
The phase difference is $1 \lambda m$.

$$y_{61}(x) := \int_{1.85}^{2.15} \cos\left(2 \cdot \pi \cdot \frac{x - \delta_3}{\lambda}\right) + \cos\left(2 \cdot \pi \cdot \frac{x}{\lambda}\right) d\lambda$$

$$a_3 \equiv 1$$

$$\delta_3 \equiv \lambda m \cdot a_3$$

