

Multiple Source Interference --> Fraunhofer Diffraction

```
Clear["Global`*"];
Off[General::spell1];
```

$$\text{int2}[x_] = \left(\frac{\text{Sin}[x]}{2 \text{Sin}[x/2]} \right)^2;$$

$$\text{int3}[x_] = \left(\frac{\text{Sin}[x]}{3 \text{Sin}[x/3]} \right)^2;$$

$$\text{int4}[x_] = \left(\frac{\text{Sin}[x]}{4 \text{Sin}[x/4]} \right)^2;$$

$$\text{intN}[x_] = \left(\frac{\text{Sin}[x]}{x} \right)^2;$$

- Calculate and plot the intensity vs $x = \pi$ (Slit Width) $\text{Sin } \theta / \lambda$ for different numbers of sources spaced evenly across the slit: 2 (blue), 3 (green), 4 (red), ∞ (black).

```
Plot[Evaluate[{int2[x], int3[x], int4[x], intN[x]}],
{x, 0, 4 \pi}, PlotRange -> {{0, 4 \pi}, {0, 1}},
PlotStyle -> {RGBColor[0, 0, 1], RGBColor[0, 1, 0], RGBColor[1, 0, 0], RGBColor[0, 0, 0]},
GridLines -> Automatic, Frame -> True,
FrameLabel -> {"\pi Width Sin \theta / \lambda", "Intensity"}, RotateLabel -> False];
```

