UNIT 3: WORKSHEET

We study a few limits related to the sinc function.

The Sinc function

A prototype function for studying limits is the sinc function

$$f(x) = \frac{\sin(x)}{x} \ .$$

It is an important function and appears in many applications like in the study of waves or signal processing. It is used in low pass filters for example. **sinc** comes from its original latin name **sinus cardinalis**.

1: Does the function $\frac{\cos(x)}{x}$ have a limit at $x \to 0$?

2: Does the function $\frac{\sin(x^2)}{x^2}$ have a limit for $x \to 0$?

sinc(x)

x

2π
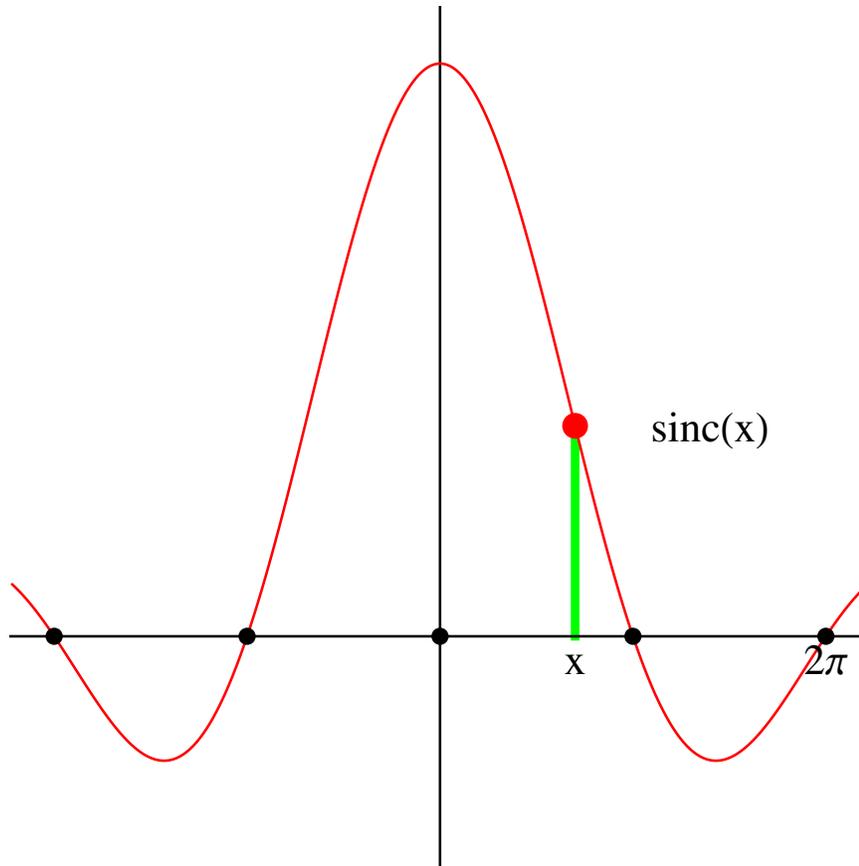
3: Does the function $\frac{\sin(x^2)}{x}$ have a limit for $x \to 0$?

4: Does the function $\frac{\sin(x)}{x^2}$ have a limit for $x \to 0$?

5: Does the function $\frac{x}{\sin(x)}$ have a limit for $x \to 0$?

6: Does the function $\frac{\sin(x)}{|x|}$ have a limit for $x \to 0$?