For max efficiency (on homework),
do the versions of the problems given
in the videos. You can grab 'em from
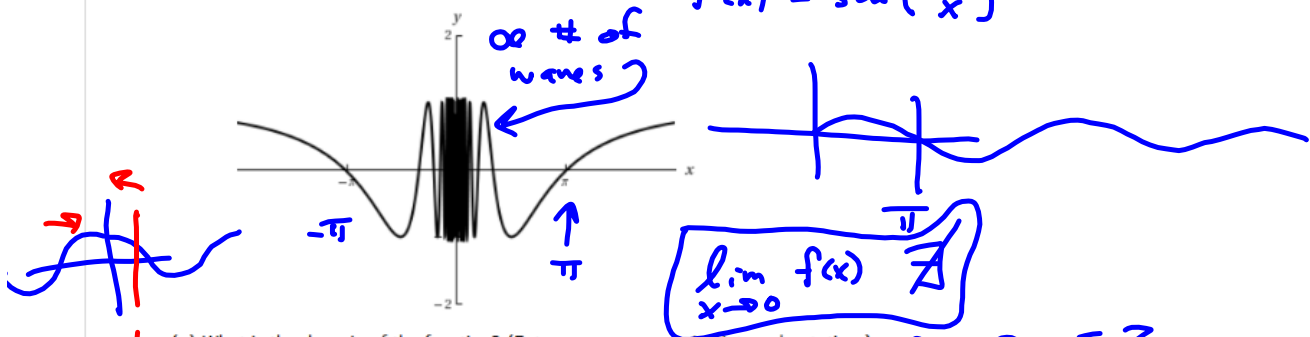the notes that go with the videos

**47.** ⊕ −/9 points LarTrig9 2.3.088.

Consider the function

$$f(x) = \cos\frac{5}{x}$$

and its graph shown in the figure.

*Topologists' sine curve:*

$$f(x) = \sin\left(\frac{1}{x}\right)$$

∞ # of waves

$$\lim_{x \to 0} f(x) \;\; ∄$$

(a) What is the domain of the function? (Enter your answer using interval notation.)

$$\mathcal{D} = \mathbb{R} \setminus \{0\}$$
$$= (-\infty, 0) \cup (0, \infty)$$

(b) Identify any symmetry of the graph.    y-axis

Identify any asymptotes of the graph. (If an answer does not exist, enter DNE.)

(c) Describe the behavior of the function as $x \to 0$.    as $x \to 0$, it oscillates an ∞ # of times between $y = \pm 1$.

(d) How many solutions does the equation

$$\cos\frac{5}{x} = 0$$    ∞ # of solns

have in the interval $[-5, 5]$? (If there are infinitely many solutions, enter INFINITELY MANY.)

[          ] solution(s)

(e) Does the equation $\cos(5/x) = 0$ have a greatest solution? If so, then approximate the solution. (Round your answer to four decimal places. If there is no greatest solution, enter NO SOLUTION.)

$x =$ [          ]
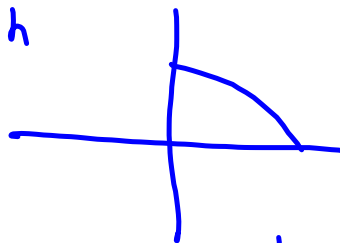
Yes.

once $\dfrac{5}{x} = \pi$

$x = \dfrac{5}{\pi}$

from $x = \dfrac{5}{\pi}$ to $\infty$, we're
getting this much of $\cos(x)$
graph
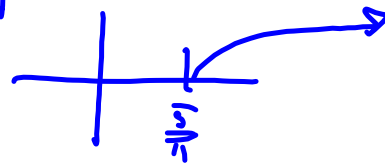
$x \to \infty$

$\dfrac{5}{x} \to 0$

$\dfrac{5}{10000000}$

only

$\dfrac{\sin x}{x}$    is another weird one.

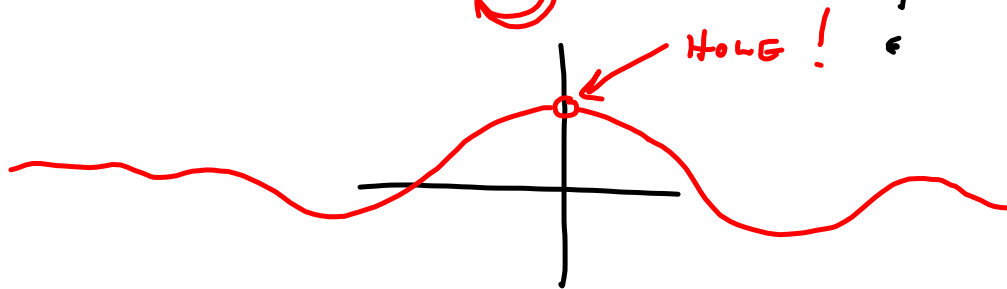$\sin x \xrightarrow{\; x \to 0 \;} 0$

$x \xrightarrow{\; x \to 0 \;} 0$

so   $\dfrac{\sin x}{x} \xrightarrow{\; x \to 0 \;} \dfrac{0}{0}$

$\sin x$ & $x$ approach zero at the same rate, so it's actually:
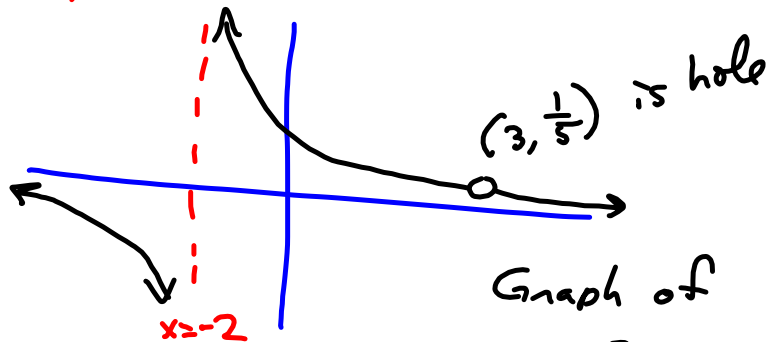
$\dfrac{\sin x}{x} \xrightarrow{\; x \to 0 \;} 1$

HOLE !



$\dfrac{1}{x+2} = \dfrac{x-3}{(x+2)(x-3)}$

**NOT Define @**
$x = -2, \; x = 3$

when $x \neq 3$

$\dfrac{1}{3+2} = \dfrac{1}{5}$

$\left(3, \tfrac{1}{5}\right)$ is hole

$x = -2$

Graph of

$\dfrac{x-3}{x^2 - x - 6} = \dfrac{1}{x+2},$ when $x \neq 3$.