MATH 31 - Calculus. Homework 3. Due Th. 03/06/2025. Professor Luis Fernández

NAME:_____

Do not write your answers here.
Write your answers in other sheets and **STAPLE them to this one.**

1. Let $r(x) = f(g(h(x)))$, where $h(1) = 2$, $g(2) = 3$, $h'(1) = 2$, $g'(2) = 5$ and $f'(3) = 6$. Find $r'(1)$.

2. Evaluate, justifying your answer:

(a) $\lim\limits_{x \to \infty} x \sin\left(\dfrac{1}{x}\right)$ [HINT: do a change of variable $t = \frac{1}{x}$.]

(b) $\lim\limits_{x \to 0} \dfrac{\tan x}{x}$

3. If $g(x) = xf(x)$, where $f(3) = 4$ and $f'(3) = -2$, find an equation of the tangent line to the graph of g at the point where $x = 3$.