

### MATH 101 QUIZ 5

1. Let the linear approximation of  $f(x) = x^2 \tan^{-1} x + e^{-x^2}$  at  $x = 1$  be  $ax + b$  for some real numbers  $a$  and  $b$ . Compute  $a + b$ .
2. Evaluate the slope of the tangent line of the curve  $y = (1 + \cosh x)^{\tan^{-1} x}$  at  $x = 0$ .
3. Find the minimum and the maximum of  $f(x) = 2 \cos x + \sin 2x$  on  $[0, \pi/2]$ .
4. Let  $f$  be a differentiable function. Suppose that  $f(3) = 2$  and  $f'(x) \leq 3$  for every  $x$ . Find the possible smallest value of  $f(1)$ .