

Midterm 2

Math 31B, Winter 2022

Midterm Exam: Friday, February 25.

Please read the policies for online midterms posted on Canvas, under Modules – Syllabus and Policies.

You may solve these problems by any method you like (as long as the method is correct).

1. Determine whether the following limit exists, and if so, evaluate it:

$$\lim_{x \rightarrow 0} \frac{\sin x - x}{x^3}.$$

2. Determine whether the following integral converges, and if so, evaluate it:

$$\int_5^{\infty} \frac{dx}{x^2 - 1}.$$

3. Determine whether the following limit exists, and if so, evaluate it:

$$\lim_{n \rightarrow \infty} \sqrt{n^2 + 1} - 2n.$$

4. Determine whether the following sum converges, and if so, evaluate it:

$$\sum_{n=0}^{\infty} 3^{1-2n} + 2^{2-n}.$$