Math 1B: Calculus **Spring 2020**

Discussion 7: Improper Integrals

Instructor: Alexander Paulin Date: Feb 10, 2020

1. Determine whether each integral is convergent or divergent. Evaluate those that are convergent.

   (a) $\displaystyle\int_1^\infty \frac{1}{(2x+1)^3}\,dx$

   (b) $\displaystyle\int_{-\infty}^0 2^r\,dr$

   (c) $\displaystyle\int_{-\infty}^\infty (y^3 - 3y^2)\,dy$

(d) $\int_0^1 r \ln r \, dr$

(e) $\int_0^{\frac{\pi}{2}} \tan^2 \theta \, d\theta$

2. Find the values of p for which the integral is convergent.

(a) $\int_1^\infty \frac{1}{x^p} \, dx$

(b) $\int_0^1 \frac{1}{x^p} \, dx$