Problem Set IV, MAT 382, Fall 2020

Due December 7, 2020

Read Chapters 15 and 16 from the text book.

1. Chapter 15: Exercises 6, 9, 12.
2. Chapter 16: Exercises 5, 8, 10, 18.
3. Let (X, d_X) and (Y, d_Y) be two Gromov hyperbolic proper geodesic metric spaces. Show that a quasi-isometry $f\colon X \to Y$ induces a homeomorphism $f_\star\colon \partial X \to \partial Y$ between their Gromov boundaries.
4. Prove $\mathbb{Z}^2$ is not quasi-isometric to $\mathbb{Z}$.
5. Find an example of an infinite group whose abelianization is the trivial group.