23MAC260 Problem Sheet 5

Week 5 Lectures

Last updated February 27, 2024

1. For each of the following curves, calculate the torsion subgroup $T \subset E(\mathbb{Q})$:
   (a) $y^2 = x^3 - 27$;
   (b) $y^2 = x^3 + 4x$.
   (c) $y^2 = x^3 - 16x + 16$.
2. Prove (as stated in the Week 4 lectures) that the torsion subgroup T of the curve defined by
$$y^2 = x^3 + 2$$
is the trivial group $T = \{O\}$.
3. Compute the torsion subgroup T of the curve defined by the equation
$$y^2 = x^3 - \frac{15}{16}x + \frac{11}{32}.$$