

Lecture 03 Worksheet (ECON211), AY 2025-26

#1: \_\_\_\_\_ #2: \_\_\_\_\_ #3: \_\_\_\_\_

These problems test your knowledge and understanding of basic algebra. Please note that these problems are set a few notches above the class-level. So, it is best to approach them in groups.

1. What will be the remainder if you divide  $5^{123456}$  by 7?

2. What will be the sum of all real values of  $x$  for which  $\left(\frac{1}{8}\right)^k \times \left(\frac{1}{32768}\right)^{\frac{1}{3}} = \left(\frac{1}{8}\right) \times \left(\frac{1}{32768}\right)^{\frac{1}{k}}$ ?

3. There are three quadratic equations  $x^2 + px + 9 = 0$ ,  $x^2 + qx + 17 = 0$ , and  $x^2 + (p + q)x + 35 = 0$  such that they share a common root which happens to be a negative number. What is the value of  $2p + 3q$ ?

4. Let  $x$  and  $y$  be two natural numbers such that  $x^2 + xy + x = 14$  and  $y^2 + xy + y = 28$ . What will be the value of  $3x + 2y$ ?