

Last Name: _____ Name: _____ Student No.: _____

This quiz has **three** questions. Make your answers as clear as you can. You have 30 minutes to complete this quiz.

1. (*4 points*) Find all integer solutions of the equation $x^2 + x = y^2$.

2. (*4 points*) How many irrational solutions x does the equation $x^3 - 5x + 2 = 0$ have? Find them explicitly.

3. (*2 points*) Decide whether the equation $x^2 - y^2 = 2$ has zero, finitely many or infinitely many rational solutions x, y . Justify your answer.