

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*) Show that the equation $x^2 + 2y^2 = z^2$ has no solutions with x and y both odd.

2. (*4 points*) Show that $\sqrt{2 + \sqrt{3}}$ is irrational.

3. (2 points) Find at least 3 different rational solutions (x, y) to the equation

$$x^2 + 3y^2 = 4$$

with $x > 0$ and $y > 0$.