

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  $x^2 \equiv a \pmod{21}$  has either 1, 2 or 4 solutions modulo 21.

**2.** (*4 points*)

1. Solve the congruence

$$x \equiv 3 \pmod{7}$$

$$x \equiv 2 \pmod{15}$$

2. Solve the congruence

$$x \equiv 3 \pmod{35}$$

$$x \equiv 2 \pmod{15}$$

**3.** (*2 points*) Find **all** solutions of the congruence  $x^{42} \equiv 4 \pmod{100}$ .