

# Applied Algebra

**Instructions** Please write your name in the upper right-hand corner of the page. Use complete sentences, along with any necessary supporting calculations, to answer the following questions.

1. Find an integer  $x$  such that  $100x \equiv 7 \pmod{433}$ .

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2. In  $\mathbb{Z}_8$  there are eight elements: the congruence classes  $[0], [1], \dots, [7]$ .  
How many of these eight elements have multiplicative inverses in  $\mathbb{Z}_8$ ?