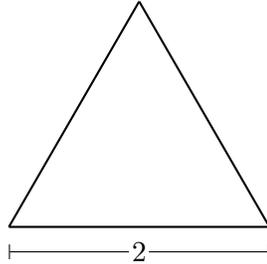Name: _____

Directions: Show all work.

1. [**4 points**] Let S be a set of 5 points in an equalaterial triangle with side length 2. Prove that S contains a pair of points that are at distance at most 1.

2. [**2 parts, 3 points each**] Recall that two integers x and y are *relatively prime* if their greatest common divisor is 1.

   (a) Find a maximum size subset of $\{1, \ldots, 8\}$ such that no two elements in A are relatively prime. Prove your answer is correct.

   (b) Find a maximum size subset of $\{1, \ldots, 2n\}$ such that no two elements in A are relatively prime. Prove your answer is correct.