For each algorithm described below, determine whether the method works in all cases. If so, explain how you know the method works and explain why it works. If not, give an example where the method fails.

1. **Divide two-digit numbers.**
   When the ones digit of one equals the tens digit of the other, divide by simply “cancelling” the equal digits. Examples:

   \[
   \frac{44}{14} = 4 \quad \frac{19}{95} = \frac{1}{5} \quad \frac{95}{29} = \frac{5}{2} \quad \frac{98}{49} = \frac{8}{4} = 2.
   \]

2. **Square a two-digit number ending in 5.**
   Example: 65^2.
   Step 1: Multiply the tens digit by the number one more than itself: \(6 \times 7 = 42\).
   Step 2: Append 25 on the end of the result of Step 1: \(65^2 = 4225\).

3. **Square any two-digit number.**
   (Generalizes the previous method.)
   Example: 83^2.
   Step 1: Multiply the tens digit by itself and append two zeros: \(8 \times 8 = 64 \longrightarrow 6400\).
   Step 2: Multiply the ones digit by itself and add to the result of Step 1:
   \[3 \times 3 = 9 \longrightarrow 6400 + 9 = 6409.\]
   Step 3: Multiply the tens digit by twice the ones digit and append a zero:
   \[8 \times (2 \times 3) = 48 \longrightarrow 480.\]
   Step 4: Add the results of Step 2 and Step 3: \(6409 + 480 = 6889 = 83^2\).