MATH 201-1 SPRING 2025 PRACTICE TEST #1

Write clearly, on separate paper. All questions carry equal weight.
You will receive credit for your three best answers.

Prove or disprove three of the following statements:

(1) For sets A and B, one has
$$\mathcal{P}(A) \cup \mathcal{P}(B) = \mathcal{P}(A \cup B).$$

(2) The number $\log_{10} 16$ is irrational.

(3) For positive integers a, b, c, if $a \mid b$, $b \mid c$ and $c \mid a$, then $a = c$.

(4) If $x < y < 0$, then $x^4 < y^4$.