

**MATH 201-1 SPRING 2023 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

$$\mathcal{P}(A) \setminus \mathcal{P}(B) = \mathcal{P}(A \setminus B).$$

(2) The number  $\log_4 14$  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  $x^3 < y^3$ .