

## MATH 201 FALL 2020 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  $A, B$ , one has

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

- (2) For integers  $x$  and  $y$ , if  $x - 3y$  is odd, then  $x$  and  $y$  have opposite parity.
- (3) For positive integers  $a, b, c$ , if  $a \mid b$ ,  $b \mid c$ , and  $c \mid a$ , then  $b = c$ .
- (4) If  $y < x < 0$ , then  $x^4 < y^4$ .