

## Math 4317, Self Assessment 4

### Incompleteness of $\mathbb{Q}$

Let

$$A = \{x \in \mathbb{Q} : x^2 \leq 2\}$$

where  $\mathbb{Q}$  denotes the rational numbers.

1. Show that if  $b \in P = \{x \in \mathbb{Q} : x > 0\}$  is positive and  $b^2 < 2$  then  $b$  is **not** an upper bound of  $A$ , i.e., find a rational number  $c \in A$  with  $c > b$ .

- I was able to do this.
  - I was not able to do this.
    - I see how to do it now.
    - I don't think I'll ever be able to understand this.
  - I refuse to participate in self-assessment.
2. True or False: There exists a least upper bound  $b \in \mathbb{Q}$  for  $A$ .

- I was able to do this.
- I was not able to do this.
  - I see how to do it now.
  - I don't think I'll ever be able to understand this.
- I refuse to participate in self-assessment.