MAT 108 SQ 2020 HW5 (Due date 04/10) Grading Rubric
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\( \text{(a)(ii) (3 pts)} \)
- Completion (3 pts)
  - 3/3: honest attempt at all probs
  - 2/3: missing 1-2 probs
  - 1/3: missing 3+ probs
  - 0/3: did nothing

\( \text{(d) (2 pts)} \)
Correct answer:

Let \( x \) be a real number.

1 pt [ Suppose \( x \geq 1 \).

Then \( x+1 \geq 2 \) and \( x-1 \geq 0 \).

1 pt [ This means that \((x+1)(x-1) \geq 0\).

We conclude that for any real number \( x \), if \((x+1)(x-1) < 0\), then \( x < 1 \).

\( \text{(d) (5 pts)} \)
Correct answer:

Let \( a \) and \( b \) be positive integers.

1 pt [ For the sake of contradiction, assume that \( a-b \) is odd and \( ab \) is even.

1 pt [ Because \( ab \) is even, we have \( ab = 2m \) for some integer \( m \).

1 pt [ This means that \( a = 2m-b \) with \( m \) the same as above.

1 pt [ Therefore, \( a-b = 2m-b-b = 2m-2b = 2(m-b) \), where \( m-b \) is again an integer since both \( b \) and \( m \) are integers.

1 pt [ Because we assumed that \( a-b \) is odd, this is a contradiction and we conclude that \( a-b \) is odd.