Name:_____

NetID:_____ **Lecture:**   **B**

Discussion: **Friday**   **11**   **12**   **1**   **2**   **3**   **4**   **5**

(15 points) Use proof by contrapositive to prove the following claim, using your best mathematical style and working directly from the definitions of "odd" and "even." (You may assume that odd and even are opposites.)

For all integers x and y, if $3x + y^2 + 2$ is odd, then x is even or y is even.

You must begin by explicitly stating the contrapositive of the claim:

Name:_____

NetID:_____   **Lecture:**   **B**

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(15 points) Recall that a real number p is rational if there are integers m and n (n non-zero) such that $p = \frac{m}{n}$. Use this definition and your best mathematical style to prove the following claim:

For all rational numbers x, y and z, if y is non-zero, then $5(\frac{x}{y}) - 2z$ is rational.