| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| L | A | S | T | | N | A | M | E | | | | | | | | |

,

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| F | I | R | S | T | | N | A | M | E | |

**MATH 3070/5070 (Barsamian) Bonus Quiz 1 About Assessing Proof Validity, Worth 5 Points**

Due at the start of class Mon Oct 10

**[1]** Claim: The sum of any even integer and any odd integer is an odd integer.

Proof

(1) Suppose that $a$ is an even integer and $b$ is an odd integer.

(2) Then $a = 2k$ and $b = 2k + 1$, where $k$ is an integer, by (1) and definition of even and odd.

(3) Therefore, $a + b = 2k + (2k + 1) = 4k + 1 = 2(2k) + 1$.

(4) Observe that $2k$ is an integer, so $a + b = 2(2k) + 1$ is odd, by definition of odd.

End of Proof

**Question:** Is the proof valid? Explain. On a scale of 0 - 10, how would you rate the proof?

**[2]** Claim: The sum of any even integer and any odd integer is of the form $4k + 1$ for some integer $k$.

Proof

(1) Suppose that $a$ is an even integer and $b$ is an odd integer.

(2) Then $a = 2k$ and $b = 2k + 1$, where $k$ is an integer, by (1) and definition of even and odd.

(3) Therefore, $a + b = 2k + (2k + 1) = 4k + 1$, where $k$ is an integer.

End of Proof

**Question:** Is the proof valid? Explain. On a scale of 0 - 10, how would you rate the proof?

**[3]** Claim: All odd integers are equal.

Proof

(1) Suppose that $a$ and $b$ are odd integers.

(2) Then $a = 2k + 1$ and $b = 2k + 1$, where $k$ is an integer, by (1) and definition of odd.

(3) So $a = b$, by (2).

End of Proof

**Question:** Is the proof valid? Explain. On a scale of 0 - 10, how would you rate the proof?