Worksheet 2b

1. Know the definition of the following:
    a. Odd
    b. Even
    c. Parity
    d. m divides n ($m|n$)
2. Know the basic proof methods:
    a. Direct proof
    b. Proof by contrapositive
    c. Proof of biconditional
    d. Proof by contradiction
    e. Disproof by counterexample
3. Ways to prove $P \Rightarrow Q$:

4. Ways to prove $P \Leftrightarrow Q$:

More Practices:

1. Prove: Let x, y be integers. Then $4|(x^2 + y^2)$ if and only if x and y have the same parity.

2. Recall $|x| = \begin{cases} x & x \geq 0 \\ -x & x < 0 \end{cases}$

   Prove Triangle Inequality: $|x + y| \leq |x| + |y|$

3. Prove or disprove: For every natural number n, if $4|(n^2 - 1)$, then $4|(n - 1)$

4. Prove that if $a|b$, then $|a||b|$

5. Prove: There exist no integers a and b for which $18a + 21b = 1$

6. Prove: Suppose a, b, c are positive real numbers. If $ab = c$, then $a \leq \sqrt{c}$ or $b \leq \sqrt{c}$