

MATH 20, WORKSHEET 1

PROOF TECHNIQUES

EDGAR COSTA

RECALL

- Contrapositive: “if A , then B ” is logically equivalent to “if not B , then not A ”
- Contradiction: assume that the statement you want to prove is false...
- if A implies B , and B implies C , then A implies C .

WARMUP PROBLEMS

- (1) For every integer x , the integer $x(x + 1)$ is even. (Hint: consider the different cases)
- (2) By contradiction, show that: If $x \cdot y$ is even then either x or y is even.
- (3) By contrapositive, show that: If n is a positive natural number and n^2 is even, then n is also even.

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- (1) If $x + y$ is even, then either x and y are both even or x and y are both odd.
- (2) Let x, y be integers. If x divides y and x is even, then y is even.