

CHAPTER 5 - PROOF BY CONTRAPOSITIVE

RECALL THAT

$P \Rightarrow Q$ IS LOGICALLY EQUIVALENT TO $\sim Q \Rightarrow \sim P$

DIRECT PROOF:

TO PROVE $P \Rightarrow Q$:

PROOF:
SUPPOSE _____
:
THEREFORE _____ $\square$

PROOF BY CONTRAPOSITIVE:
TO PROVE $P \Rightarrow Q$:

PROOF:
SUPPOSE _____
:
THEREFORE _____ $\square$

EX: IF a IS A MULTIPLE OF 14, THEN a IS NOT ODD.

- TO PROVE THIS DIRECTLY, ASSUME _____, AND SHOW _____.
- WRITE DOWN THE CONTRAPOSITIVE OF THE STATEMENT:
- TO PROVE THE STATEMENT BY CONTRAPOSITIVE, ASSUME _____, AND SHOW _____.

EX: PROVE THAT IF $x^2 + 3x < 0$, THEN $x < 0$.

PROOF (by contrapositive):

SUPPOSE _____.