

7. Consider the statement "if $3 < x$, then $9 < x^2$ ".
 (a) What is the converse of the original statement?

If $9 < x^2$, then $3 < x$.

- (b) Is (a) logically equivalent to the original statement?

No

- (c) What is the contrapositive of the original statement?

If $x^2 \leq 9$, then $x \leq 3$.

- (d) Is (c) logically equivalent to the original statement?

Yes

8. Is the following argument valid?

For all students x , if x studies discrete mathematics, then x is good at logic.

Jill is not good at logic.

\therefore Jill does not study discrete mathematics.

Yes. It is modus tollens

$$\begin{array}{l}
 P \rightarrow Q \\
 \sim Q \\
 \therefore \sim P
 \end{array}$$