

### Math 122 In-Class Assignment 3 - Solutions

1. Use the Laws of Logic to show:

$$[(p \vee q) \rightarrow q] \Leftrightarrow (p \rightarrow q)$$

Remember to write the name of the Law used in each step!

**Solution:**

$[(p \vee q) \rightarrow q]$	$\Leftrightarrow$	$\neg(p \vee q) \vee q$	known L.E.
	$\Leftrightarrow$	$(\neg p \wedge \neg q) \vee q$	DeMorgan's
	$\Leftrightarrow$	$(\neg p \vee q) \wedge (\neg q \vee q)$	Distributive
	$\Leftrightarrow$	$(\neg p \vee q) \wedge \mathbf{1}$	known L.E.
	$\Leftrightarrow$	$\neg p \vee q$	Identity
	$\Leftrightarrow$	$p \rightarrow q$	known L.E.