Useful Equivalences: Each of these equivalences can be proven using our current rules of inference. (Hint: Know how to prove them!)

$$(x)(Fx \,\&\, Gx) \iff (x)Fx \,\&\, (x)Gx$$

$$(\exists x)(Fx \vee Gx) \iff (\exists x)Fx \vee (\exists x)Gx$$

$$-(x)Fx \iff (\exists x) - Fx$$

$$-(\exists x)Fx \iff (x) - Fx$$

If ϕ and ψ are logically equivalent WFFs (what does this mean??), then $(x)\phi$ and $(x)\psi$ are logically equivalent, and $(\exists x)\phi$ and $(\exists x)\psi$ are logically equivalent.

> *Example:* Since $-(Fx \rightarrow Gx)$ is logically equivalent to $Fx \,\& - Gx$, it follows that $(x)(-(Fx \rightarrow Gx))$ is logically equivalent to $(x)(Fx \,\& - Gx)$.