Foundations of Mathematics Exam One Review

1. Be prepared to define the following:
   (a) $a|b$
   (b) Even
   (c) Odd
   (d) Prime
   (e) Composite
2. Know truth tables for the following:
   (a) If-then $(\Rightarrow)$
   (b) If and only if $(\Leftrightarrow)$
   (c) And $(\wedge)$
   (d) Or $(\vee)$
   (e) Not $(\neg)$
3. Know the following proof templates
   (a) Direct proof of an *if then* statement.
   (b) Direct proof of an *if and only if* statement.
   (c) Refuting a false *if then* statement.
   (d) Truth table of logical equivalence.
4. Be prepared to write proofs.
   Examples:
   (a) Prove the following: If a, b, and c be integers, $a|b$, and $a|c$, then $a|(b+c)$.
   (b) Disprove: If a, b, and c are integers, $a|c$ and $b|c$, then $(a+b)|c$.
   (c) Show that the Boolean expressions $(\neg x) \vee y$ and $x \Rightarrow y$ are logically equivalent.