Answers to Concept Quiz 3.2

1. **Contrapositives**
   Which (if any) of the following is a contrapositive of the statement $P \leftrightarrow Q$?

   ✓ $\neg P \leftrightarrow \neg Q$.

   ✗ $(P \wedge Q) \vee (\neg P \wedge \neg Q)$.

   ✓ $\neg Q \leftrightarrow \neg P$.

2. **More contrapositives**
   Which (if any) of the following is a contrapositive of the statement $A \rightarrow (B \vee C)$?

   ✗ $(B \vee C) \rightarrow A$.

   ✗ $\neg A \vee (\neg B \wedge \neg C)$.

   ✓ $(\neg B \wedge \neg C) \rightarrow \neg A$.