Show all work needed to reach your answers.

1. (8 points) Please identify each of the following as either a predicate (P), an implication (I), or a statement which is not an implication (S). For each implication, please circle the hypothesis and underline the conclusion.

   (a) I  If $x+y$ is odd and $y+z$ is odd, then $x+z$ is odd.

   (b) S  Some functions are not continuous.

   (c) I  $A \Rightarrow B$

   (d) S  The instructor picked all 16 games correctly on Thursday.

   (e) I  When $x = 2$, one finds $y = 5$.

2. (10 points) Please complete the following truth table.

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>$A \lor C$</th>
<th>$\neg A$</th>
<th>$\neg (A \Rightarrow B)$</th>
<th>$(B \land \neg C) \lor A$</th>
<th>$(B \Rightarrow (A \lor C)) \iff ((C \lor \neg (\neg B)) \Rightarrow A)$</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>T</td>
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<td>T</td>
</tr>
</tbody>
</table>

3. (2 points) Please write $C \lor \neg B$ as an implication using $\Rightarrow$ symbol.

   Notice that $\neg (C \lor \neg B) \equiv \neg C \land B \equiv B \land \neg c \equiv \neg (B \Rightarrow C)$

   So $ (C \lor \neg B) \iff (B \Rightarrow C) \iff (\neg C \Rightarrow \neg B)$