

## Work on these with your partner(s) at the board

1. Let  $p$  be the statement “The windchill is below zero”,  
 $q$  be the statement “I am wearing a hat today”, and  
 $r$  be the statement “I overslept this morning”  
Express each of the following using  $p, q, r$  and logical connectives:
  - (a) If the windchill is below zero, then I am wearing a hat today.
  - (b) If I am wearing a hat today, then the wind chill is below zero or I overslept.
2. Show that a conditional statement and its contrapositive are logically equivalent to each other by building the truth tables.
3.
  - (a) State the converse of 1(a)
  - (b) State the contrapositive of 1(b)
4. Provide an example of a true conditional proposition whose converse is false.
5. Provide an example of a true conditional proposition whose inverse is false.
6. Provide an example of a true conditional proposition whose contrapositive is false.