In class 2 Name: _____

Suppose $P(A) = \frac{1}{2}, P(B) = \frac{1}{3}, P(A|B) = \frac{3}{4}$
With this infromation we can find many more probabilities

1. By definition, $P(A|B) = \dfrac{P(A \cap B)}{P(B)}$. Therefore $P(A \cap B) =$
2. $P(A \cup B) = P(A) + P(B) - P(A \cap B)$. Therefore $P(A \cup B) =$
3. $P(B \cup A) =$
4. $P(A^c) =$
5. $P(B^c) =$
6. Since $P(B) = P(A \cap B) + P(A^c \cap B)$ we know $P(A^c \cap B) =$
7. Now we know all the numbers we need to find $P(A^c \cup B) = P(A^c) + P(B) - P(A^c \cap B)$

Here is another problem of the same type, but with different numbers:
Let $P(A) = .6, P(B) = .4, P(A \cap B) = .3$

1. $P(A^c)$
2. $P(B^c)$
3. $P(A|B)$
4. $P(B|A)$
5. $P(A^c \cap B)$
6. $P(A \cap B^c)$
7. $P(A|B^c)$
8. $P(B^c|A)$
9. $P(B|A^c)$
10. $P(A^c|B)$
11. $P(A \cup B)$
12. $P(A \cup B^c)$
13. $P(A^c \cup B)$
14. $P(A^c \cup B^c)$