Write the hypothesis and conclusion of each conditional.

1) If it rains, then the game will be cancelled.

2) If you do not sleep, you will be tired.

3) $AB = BC$ if B is the midpoint of $\overline{AC}$.

4) If $x = -2$, then $x^2 = 4$

Show that each conditional is false by finding a counterexample.

5) If an animal is a bird, then it is a penguin.

6) If $x > 2$, then $x > 5$

7) If a number is divisible by 2, then it is divisible by 4.

Write the converse of each statement.   If the converse is true, write *true*. If the converse is false, give a counterexample.

8) If two angles are right angles, then they are congruent.

9) If $x + 20 = 25$, then $x = 5$.

10) If $x = 3$, then $x^2 = 9$

11) If $x = -11$, then $|x| = 11$

Answer Key

1) H: it rains, C: the game will be cancelled
2) H: you do not sleep, C: you will be tired
3) H: B is the midpoint of $\overline{AC}$, C: $AB = BC$
4) H: $x = -2$, C: $x^2 = 4$
5) Counterexample (answers may vary): Robin (or any bird)
6) Counterexample (answers may vary): x = 3, 4 or $2 < x < 5$
7) Counterexample (answers may vary): 10 is divisible by 2 but not by 4.
8) Converse: If two angles are congruent, then they are right angles
   False
   Counterexample: $\angle 1 = 40$ and $\angle 2 = 40$ These are congruent but not right angles.
9) Converse: If $x = 5$, then $x + 20 = 25$
   True
10) Converse: If $x^2 = 9$, then $x = 3$
    False
    Counterexample: -3
11) Converse: If $|x| = 11$, then $x = -11$
    False
    Counterexample: 11