The Wind

In this problem, we wish to look at some general motion. So, I will make up some numbers to amplify an effect.

Problem 1 Suppose you shoot a rocket straight north. You have painted the right side of the rocket red, and the left side blue. The rocket is going at a speed so that it will take exactly 12 hours to reach a target in Russia.

Six hours from now, when the rocket crosses the north pole, where will you be?
Since the earth takes 24 hours to make a complete revolution, in 6 hours you will be somewhere where the north-Atlantic was when the rocket was fired.

At this point, what will you see if you look at the rocker?
You will see the right, or the red side of the rocker as it passes the north pole.
Think about it.

In another six hours, 12 hours since the rocket was fired, where will you be?
12 hours will put you where Russia was when the rocket was fired.

At this point, what will you see if you look at the rocker?
You will see the rocket heading straight for you. Duck quick.
Think about it.

For the entire journey, watching the rocket, it will appear as if it turned to its right and came back to get you. Think about this.

Problem 2 Suppose you shoot a rocket at a target two hundred miles to your south. Suppose further that it will take 2 hours to get to the target. Where will the rocket hit?
In two hours, the target will have moved a distance to the east – the earth is turning.

Since you aimed for the target where is was two hours ago, It will appear as if the rocket turned to its right and missed the target. Thing about it.

In both of these problems, it appears as if the rocket turned to its right. But, the rocket went straight while the earth turned under it. This is known at the Coriolis effect. Any motion in the northern hemisphere will appear to move to its right. (Reverse direction in the southern hemisphere.)

Now for the real problem. Suppose there is a high pressure area. The air will tend to move away from the high pressure area. What direction will the air appear to be moving?

The moving air will appear to be moving to its right. Around a high pressure area the wind direction will be _____ (clockwise, or counter-clockwise.) If may help to draw a little picture.

Repeat this question for a region of low pressure. What direction will the air appear to move?

So, around a low pressure area the wind direction will be _____ (clockwise, or counter-clockwise.)

Look at the weather map some evening. What direction are the winds around a High or Low pressure.