

AOS 100/101
Spring 2019

HOMework #6
(Due Fri. April 19)

Please provide concise, grammatically correct, neatly written answers to the following questions. All questions can be answered in, at most, a few sentences. Don't forget to write your name on the paper!!!

NAME:

1) A hockey puck is placed on a *flat*, infinite sheet of ice in the Southern Hemisphere. It is then given a slight push to the west. The sheet of ice is frictionless so that the speed of the puck after the push is constant. What horizontal force acts on the puck after the push? Describe (or draw) the path the puck takes after the push. Explain your description (or drawing).

(10 pts)

2) A friend of yours who is traveling the world reports that she recently experienced a day on which the surface wind blew from the southeast while simultaneously the clouds overhead were moving from east to west. Independently, she is made aware of the fact that on that day the PGF was the same at the surface and at the cloud height. What hemisphere was she in at the time? Explain your answer.

(10 pts)

3) A local forecaster predicts that strong surface winds (i.e. speeds in excess of 15 m s^{-1}) will visit the Upper Midwest over the weekend. Which of the two statements below most likely motivated her forecast?

- (a) Small differences in sea-level pressure will exist from station to station across the area.
- (b) Large differences in sea-level pressure will exist from station to station across the area.

Give a scientific explanation of your choice.

(10 pts)

4) What two forces are balanced in geostrophic flow? The winds well above the surface in the middle latitudes are nearly in geostrophic balance. How does this fact serve as proof that the Earth rotates on its axis?

(10 pts)