Meteorology Geostrophic Wind Question

1. What determines wind speed in nature?

1. What determines wind direction in nature?

1. If I were to shoot a rocket from Layton, Utah to Cabo San Lucus, Mexico, which way would it veer due to the Coriolis effect? (Relative to us) Why?

1. Relative to the earth’s north pole, does the rocket in question 3 curve or go straight? Why?

1. Estimate how fast we are moving in Layton, Utah relative to the North Pole? (Report it in Km/hr)

(Hint: See diagram in the notes)

1. Estimate how fast the people in Cabo San Lucas, Mexico are moving relative to the North Pole? (Report it in Km/hr)
2. Since the rocket left Layton, Utah and is going to land in Cabo San Lucas, Mexico, how fast is it moving towards the west when it lands? (Report it in Km/hr)

1. If I shoot a rocket directly east from Layton, Utah, which direction would it veer?

1. Why does the Coriolis force act to the left following the motion in the Southern Hemisphere?

1. Why does the Coriolis force vanish at the equator?

1. If the Earth did not rotate on its axis, would we still have winds? If so, what would the average wind direction be in Layton, Utah.

1. It has been claimed that, in the Northern Hemisphere, the right-hand rails of railroad train tracks wear out faster than the left-hand rails. Why? (Presume that only one direction of motion is permitted on these tracks.)
2. Explain the formation of a geostrophic wind.

1. Unlike winds aloft, which blow nearly parallel to the isobars, surface winds generally cross the isobars. Explain what causes this difference.

1. a) What are the general weather conditions to be expected when the pressure tendency is rising?

b) When the pressure tendency is falling?

1. For surface low pressure to exist for an extended period, what condition must exist aloft?

1. It is theoretically possible for large-scale wind to be able to blow clockwise around large-scale lows in the Northern Hemisphere. This is termed an antibaric low. For a given isobar spacing, would you expect winds around an antibaric low to be stronger or weaker than their couterparts around a normal low?

1. Prepare a diagram (isobars and wind arrows) showing the winds associated with surface cyclones and anticyclones in both the Northern and Southern Hemispheres.