Name: _____ Section/TA: _____

Atmospheric Sciences 101, Spring 2003
Homework #6–Due the <u>beginning</u> of section Thu/Fri, 29/30 May 2003

1. Hurricanes in the Atlantic Ocean usually form at about 10-15°N of the equator near Africa. They are observed to veer off to the northeast. Hurricanes that move inland weaken dramatically within 24 hours. Using your knowledge about hurricanes *and the general circulation of the atmosphere*, answer the following questions.

   a. Why do hurricanes **<u>not</u>** form within 5° of the equator?

   b. Why do hurricanes **<u>not</u>** form at latitudes greater than 20°?

   c. Why do hurricanes initially travel from east to west?

   d. Why do hurricanes dramatically weaken as they move inland? Be sure to mention a hurricane's major source of energy.

   e. Suppose the center of a hurricane is moving toward the west and is about to hit land on the east coast of Florida (e.g. Miami). In Miami, would the damage be greater if the eye came ashore 10 miles to the north or 10 miles to the south of Miami? Why?

2. a. Explain why air-mass (single celled) thunderstorms are short lived in comparison to squall lines.

   b. Explain how a single cell storm can trigger a multicell thunderstorm.

   c. Why doesn't a typical air-mass thunderstorm produce tornadoes?

3. Circle the words that complete the following sentences describing conditions suitable for tornado formation.

   Warm, moist air located at (upper / lower) levels.

   Cold, dry air located near (700 mb / surface).

   Upper level jet stream located (near / far from) the region of formation.

   Upper level trough located to the (east / west) of the surface (high / low).

4. Buzz (who has been struck by lightning several times) is standing on the metal roof of his apartment building watching the approaching thunderstorm. He sees a flash of lightning. Fifteen seconds later he hears the accompanying clap of thunder.

   a. How far off did the lightning strike? HINT: The speed of sound in air is about 0.2 miles per second.

   b. How long did it take the light from the lightning to reach your eyes? HINT: The speed of light is approximately 180,000 miles per second.

   c. Are the thunder and lightning occurring at the same place? What causes the noisy thunder?