# Past Semester's Exam Questions

**ASTR 220 Discussion # 10**

**Apr. 10, 2019**

Name: _____

Section: _____

1. Why will the region of uncertainty around an asteroid get larger if astronomers stop recording observations of it for awhile?

   A. Each position in the region of uncertainty will have a slightly different future path, and those paths will gradually diverge.

   B. The asteroid's size will likely change as it collides with other asteroids.

   C. The asteroid may leave the region of uncertainty, and then astronomers will have little idea where it is.

   D. The region of uncertainty concept indicates that astronomers do not know where the asteroid is now, so they cannot make any predictions of its future location and so must observe it nearly continuously.

2. Which one of these sizes of asteroids would we be most likely to discover just days or weeks before it impacted the Earth, and not sooner?

   A. A 160-m asteroid

   B. A 30-m asteroid

   C. A 270-m asteroid

   D. A 90-m asteroid

3. Imagine that astronomers determine that a 100-m asteroid has a significant chance of impacting the Earth in the future. If there is enough time before we need to send a deflection mission, which one of the things below would astronomers like to do **most**?

   A. Determine its rotation period

   B. Track the asteroid over time by taking many images of it

   C. Take a sample from the asteroid and return it to the Earth

   D. Send a spacecraft to orbit the asteroid

4. Astronomers can predict the path of risk of a near-Earth asteroid impact. Why doesn't this prediction mean that the asteroid will hit the Earth for certain?

   A. The asteroid's rotation rate may not be known, and this would affect the location of the path of risk.

   B. The region of uncertainty is usually wider than the Earth, so the asteroid may be in a part that does not intersect the Earth.

   C. The asteroid may be affected by a gravitational encounter with the Moon or another planet.

D. The path of risk only predicts the possible **location** of the impact but not the time; the timing may simply be off.

5. On Feb. 10, 2071, the near-Earth asteroid 2000 SG344, which is 34 - 77 m in diameter, will have a very close pass by the Earth. In fact, the center of the asteroid's region of uncertainty is predicted to pass 0.5 Earth radii away from the Earth's center, which means the center of the region of uncertainty will pass through the Earth. However, the percent chance of impact on this date is only 0.0000115%.

   **Explain** how the percent chance of impact could be so small in this situation. **Draw and label** a diagram to illustrate your explanation.