

**2007 North Carolina State Science Olympiad
B-Division Road Scholar Event**

Participants: _____

To answer the questions, you will need:

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| ✓ A scale or ruler | ✓ A protractor |
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We have handed you:

- | | |
|-------------------|--------------------------------------|
| ✓ This story exam | ✓ 2007 N.C. State Transportation Map |
| ✓ Response Sheet | ✓ New River Inlet, NC Quad Map |

You may use (if you brought it):

- ✓ A transparent piece of paper or plastic to put over the maps. You may clip this to the maps, and mark on the transparency.

Please write your names on this sheet above, and your names and school on the Response Sheet. You may write on the story exam to work out the answers, but only the answers you write on the Response Sheet will count. You must decide which map to use to answer each question. There are 33 questions, and 109 total possible points. You will draw a map on the last question. If you think you are running out of time, you may want to skip to the end to complete your map.

If a question is worth more than one point, the possible points are stated. You can get partial credit for some of these questions. If you don't know the answer, you may want to skip the question, and come back to it later if you have time. When you leave, you must turn in all the maps, this exam story, and any scratch paper that you use.

Intracoastal Cruise

Peggy, Tom, and Linda, Geomatics students, are planning a weekend excursion with their friend Lieutenant Charles Fisher. Lt. Fisher is stationed at Camp Lejeune Marine Base, and has leave for the weekend. He has invited the group on an afternoon cruise down the Intracoastal Waterway. They have accepted, and are planning their travel route to Swansboro, where they will meet Lt. Fisher. They will drive south on Interstate 40, and then east on N.C. 24.

1. What kind of road is highway 24?
2. What U.S. highway does N.C. 24 merge with after it enters Onslow County?
3. What city over 10,000 population does the U.S. highway lead to as it continues south?
4. What type of road does the U.S. highway become for a short distance as it enters the city?
5. What river does the U.S. highway cross in the city?
6. What type of airport is approximately 2 kilometers south of the U.S. highway?

7. What highway will the students take to bring them from the city to Swansboro?
8. What is the population of Swansboro?
9. If the students were to measure in a straight line from the point where highway 24 first crossed into Onslow County on their route to Swansboro, how far would it be? Round to the nearest mile or kilometer. (5 points)

The students made the trip, and boarded the cruise boat in Swansboro. As they headed southwest, Lt. Fisher told them the Atlantic Intracoastal Waterway extended from Boston, Massachusetts to Key West, Florida. It was built over many years as a series of canals, natural waterways, and channels through shallow water. It provides a path for commerce and recreation sheltered from the rougher waters of the ocean.



Lt. Fisher said, “We’ll be passing through Camp Lejeune during our cruise.” As they passed Freeman Creek, Tom said, “We’ve come unto the area shown on the quad map, New River Inlet, NC, that I brought.”

10. What is the date of the quad map?
11. What is the contour interval?
12. What is the scale ratio shown on the quad map?
13. What date was the topography compiled?
14. What is the latest date of the hydrography surveys used?
15. What color are the hydrographic contours?
16. What is the lowest ocean floor elevation shown?

As the students crossed under Onslow Beach Road, Peggy wanted to estimate their arrival time at various points. She began to scale distances.

17. Scaling in a straight line, how far is it from the Onslow Beach Road bridge to the point where the road ends on the north shore at Craig Point? Round to the nearest 100 feet or 10 meters. (10 points)
18. The cruise boat is traveling at 8 miles per hour. If the boat crossed under the Onslow Beach

Road Bridge at 1:00 p.m., what time will it pass the end of the road at Craig Point? Round the time to the nearest 5 minutes. (2 points)

As they continue, Linda looks to the southeast across an unforested area.

19. What does she see represented by the dense brown lines next to the ocean shore?

Tom sees some helicopters flying over the Camp Lejeune area. Lt. Fisher said, "A buddy of mine told me he was practicing his navigation today. He was going to hover at 34°35'30" latitude, and 77°20'16" longitude. Tom plotted the lat and long on the quad map.

20. What is the elevation of the ground at this location? (10 points)

21. How would you describe the topography at this location?

The group looks at the topography shown on the quad map.

22. What is the highest elevation shown on the map?

23. What direction does Duck Creek flow?

24. What direction does Gillets Creek flow?

The boat rounds the turn at Ward's Channel, and approached the New River.

25. What are the latitude and longitude of the benchmark shown at Shell Point? Show your answer to the nearest second. (20 points)

26. What kind of land is to the north of this benchmark?

27. What boundary does the boat cross as it enters the New River?



Lt. Fisher said, "The New River is only 50 miles long. It's the only river in the United States where the headwaters and mouth of the river are in the same county. It's good for us that the Corps of

Engineers keeps the Waterway dredged. The draft on this boat is six feet. That is, the bottom of the keel is six feet under water.”

28. What depth is the Waterway supposed to be on the part the boat has been traveling?
29. Could the boat take a side trip into Traps Bay?
30. Explain specifically why or why not, using information from the map. (5 points)
31. What is the azimuth from the benchmark at Shell Point to the Obstruction Light near the Spoil Area? Give your answer to the nearest degree. (10 points)
32. What is the name of the long, thin island located across the New River Inlet that contains the Tidal Pond, Hell Gate Creek, etc.? The island is not completely shown on the quad map. (3 points)

The group saw a fishing boat coming into the Inlet, and remarked about the beauty of the area.

33. Turn-over the answer sheet and draw a map of the area around Gillets Creek. Include Onslow Beach Road, Mockup Road, Route 172, the Waterway, and the ocean shore. Show title for your map, a north arrow, and either the scale of your map or the phrase “Not to scale.” Show as much detail as practical with the time allowed. (20 points)



This exam was written by the North Carolina Society of Surveyors Education Foundation.

Visit our website at ncseducationfoundation.com for information about a career in surveying or geomatics, or for scholarship information.