

**1999 National Science Olympiad**  
University of Chicago / Field Museum  
Road Scholar - Division B

**Harry's Bid for Freedom**

**\*Maps used in this competition**

Colorado Highway Map

Topographic Maps

Hotchkiss Quadrangle

Rye Quadrangle

**Record your answers on the answer sheet provided.**

There are 44 questions on this exam. The number of questions answered correctly will determine your team's rank. Ties will be broken by answers to selected questions. The first tie-breaking question is number 31. If a tie persists, it will be broken by the accuracy of responses to questions 40, 20 and 21 in that order. It is essential that you answer the tie-breaking questions. This is the only way you will have a chance at the higher position in the event of a tie with another school.

The following code [except for number 41 which is a general question] has been developed to help you identify which map to use in answering each question:

**HM = Colorado Highway Map**

**H = Hotchkiss Quadrangle**

**R = Rye Quadrangle**

**In the story:**

State Routes will be designated **C** Example **C-29**

U.S. Routes will be designated **US** Example **US-42**

Interstates will be designated **I** Example **I-70**

Please answer multiple choice questions with the letter of your answer choice.

**Good Luck.** You will have **50 minutes** to work on this event.

**\*Refer to the answer sheet for information on how to easily obtain the required maps for this unit.**

## Harry's Bid for Freedom

Harry Fuller had escaped. Well, escaped **is** a rather strong word. Actually, he had walked away from a minimum security prison in Hotchkiss, Colorado [F-4 on the highway map]. The judge should have suspected this might happen when he sentenced Harry to ten years just four months earlier. What else could the judge do? He couldn't sentence a non-violent, sweet as pie, con man to death row.

It was a beautiful June afternoon. Harry skipped dinner and walked over to the high school in Hotchkiss [Hotchkiss Quad, sector 4]. At the school, he met his girlfriend, Donna Madonna. She was waiting for him in her Ford Falcon.

At about 7:00 p.m., prison guards noticed that Harry was nowhere to be found. They immediately notified Jim Slammer, the superintendent of the facility.

Jim and Andy Panda, chief of security, were watching "The Longest Yard" on TV when they were notified of Harry's disappearance. Andy told Jim that he would bring Harry back, but Jim felt that Andy could use some help. He called his good friends Holly Golly and Dirk Smooth in Denver. Holly and Dirk had been bounty hunters prior to opening their own detective agency.

Detective Dirk assured Jim that he and Holly would head out within the hour.

"Dirk, do you have the map?" Holly asked.

Dirk replied, "I have all the topographic maps for Colorado, plus a state highway map."

"Good. I have all the other equipment we'll need."

Holly and Dirk loaded everything into their company vehicle, a 1999 Lexus SUV. Holly slid behind the wheel and headed West on I-70.

As they approached exit 147, Holly said, "We need gas. We're down to less than a quarter tank."

Dirk, consulting the highway map, said, "Glenwood Springs is only **1 [HM]** [A. 20; B. 26; C. 31; D. 35] miles away. That's where we head South on C-82. Let's refuel there."

"Have you ever gone skiing near Glenwood Springs?" asked Holly.

"Yes, I've gone skiing at **2 [HM]** several times. I generally hit the Natural Hot Springs Pool afterwards."

"What kind of road is C-82?"

"According to the map legend, the first 12 miles out of Glenwood Springs is a **3 [HM]** [A. Free Limited-Access, B. Toll Limited-Access, C. 4 Lane Divided, D. Principal Highway]. The road changes near Carbondale. That's where we leave C-82 to take C-133."

Holly turned off I-70 at exit 116 and pulled into a gas station on South C-82. While re-fueling, Dirk looked at the highway map and asked, "What are those green teepee-shaped symbols located along C-133?"

Holly chuckled as she replied, "What kind of detective are you anyway? Check the map key."

"Good idea! The key identifies those symbols as **4 [HM]**."

"That probably means there will be lots of tourists with their slow-moving RVs ahead. I bet we won't be able to average more than 40 miles per hour on the stretch of road between Carbondale and Hotchkiss. According to the little black numbers, that's about **5 [HM]** miles. Traveling that distance and at that speed, it'll probably take us about **6 [HM]** [A. 1 hr. 15 min., B. 1 hr. 30 min., C. 1 hr. 45 min., D. 2 hrs.] to get to Hotchkiss."

In Carbondale, Dirk took over the wheel so Holly could familiarize herself with the terrain as illustrated on the Hotchkiss Quadrangle. She found that the map scale was **7 [H]**, the contour interval was **8 [H]**, and that it was in the **9 [H]** [A. 7.5, B. 15, C. 30] minute series. The largest [contained] body of water on the quad was the **10 [H]** in sector **8 [H]**. The PLSS description of this body of water, to the quarter section, is **12 [H]**.

When they arrived in Hotchkiss, Holly and Dirk headed straight for the minimum security prison to meet up with Jim and Andy. Due to the late hour, they decided to rest that evening and get an early start in the morning.

As they were preparing to leave the following morning, Andy announced that his top assistant, Sue Monger, would be joining the team.

"Let's stop at the high school first," Sue suggested. "We received a call this morning from a Mr. Sludgemore who lives across the street from the school. He reported seeing a man dressed in prison garb around 6:00 p.m. last night."

When they arrived at the high school, Holly spotted Joe Sludgemore across the street, sitting on his porch. After carefully studying the photo handed to him, Joe identified Harry as the man he had observed getting into an old, rusted-out Ford Falcon. Joe also reported that the individual behind the wheel was a female. He reported seeing Harry change into a sport shirt and pair of Levis as the couple drove out of the school parking lot. Joe indicated that the Falcon had headed south to C-92 where the driver had made a left-hand turn.

After thanking Joe, the team returned to their vehicle and headed toward C-92. Turning left onto C-92, they had traveled only 0.35 miles when they crossed the **13 [H]** River which flows in a **14 [H]** [A. SE, B. SW, C. NE, D. NW] direction.

"Why is the river shown in purple?" asked Sue.

"Because it's a map revision which hasn't been **15 [H]**," Dirk replied.

When crossing the bridge Holly asked, "What is that cultural feature at an azimuth of 270 degrees and a distance of 0.25 miles?"

"That's the 16 [H]," replied Andy.

Continuing along C-92, they soon came upon Baxter Reservoir. While in route to Baxter Reservoir, Dirk noted that the values of the contour lines between which Baxter Reservoir lies were 17 [H] the grade of the road 18 [H] [A. gradually decreased, B. remained about the same, C. gradually increased] all the way to Baxter Reservoir.

A short distance South of the reservoir, they crossed a small stream. This stream, the source of Baxter Reservoir's water, has been classified as a/an 19 [H] [A. intermittent, B. shallow, C. perennial] stream. It was then that they spotted the rusty Ford Falcon. Harry and Donna had abandoned it, leaving the prison uniform in the back seat. Upon closer inspection, Dirk discovered that the transmission had dropped out of the car.

Andy shouted, "There are footprints in the mud next to the stream. They're headed toward that farmhouse." [SW ¼ NW ¼ Sec 10 T15S-R92W]

"Let's go!" shouted Sue.

"Dirk," Andy said, "check the quad for our coordinates. I'll radio the prison to request a helicopter. If Harry and his friend are afoot, the chopper will be a great help."

"From where the stream crosses the road, the latitude is 20\* [H] North and the longitude is 21\* [H] West."

Responding to Andy's request, the prison dispatcher notified the team that their helicopter was in route to the Pizza Hut in Grand Junction to pick up lunch for everyone and would not be back for at least an hour. Sue, in a very disgusted tone, replied, "Forget it!"

They hiked through the fields to the farmhouse and introduced themselves to Ma and Pa Teter, the owners of the farm. Pa Teter told them that the dogs had started barking around 10:00 p.m. He had looked out the window and spotted two people running in an ESE direction. Ma added that if they kept going in that direction, they would end up at Toby Winslow's house. [SE ¼ SE ¼ 10 T15S-R92W]

"What's the quickest way to Toby's house?" Andy asked.

Pa answered, "Continue on C-92 South. In about 0.15 miles, you'll come to a road. Turn left [East] and in about a mile you'll come to Toby's place. His is the only house on the road. It's just past the 22 [H] [A. vineyard, B. orchard, C. mangrove]."

"Here's the road on the map," Holly said. "According to the classification key, it's a 23 [H] [A. medium-duty, B. light-duty, C. unimproved dirt] road." They thanked the Teter's and headed for Toby's house.

When they asked Toby whether he had seen any strangers within the past couple of hours, he informed them that a man and a woman had approached him about two hours earlier. They were afoot and appeared as if they had been sleeping in their clothes. Toby proudly showed them 1000 shares of Eureka Gold Mining stock he had swapped them for his old blue Dodge Dart.

Sue turned to Dirk and Holly and whispered, "That's one of Harry's favorite scams. His girlfriend must have brought some of Harry's phony stock certificates along."

"Which way did they go?" asked Andy.

"Back toward C-92. By the way, they asked how many miles it was to Gunnison."

"Thanks for your help," Andy said to Toby as they parted company.

They left the Winslow house and returned to C-92. Turning left [South] onto C-92, they headed for Gunnison. As they crossed the Southern neat line, Holly noted that US highway 50 was only **24 [H]** miles away.

Less than a mile's travel later, Holly put aside the Hotchkiss quad and asked someone to search through the pile of quads and pass forward the neighboring quad directly South of the Hotchkiss Quad. In a few moments, Andy passed the **25 [H]** quad to her.

"What's the elevation of Gunnison?" asked Dirk.

"According to the highway map, Gunnison is **26 [HM]** above sea level," Holly replied.

As they arrived in Gunnison, Holly spotted a crowd gathered in front of the bank. They stopped to ask what was up. An elderly man informed them that a couple had sold a five caret ring to old Betsy Rich for \$500.00. She had taken the money out of her savings because they had insisted on cash. Ms. Rich had been told that the ring was a family heirloom. The man's brother was in jail in Salida, and they needed the cash to bail him out.

It turned out that the stone wasn't a diamond, but a zircon worth \$3.00 tops. Mark Ruby, the town jeweler, had come along shortly after the couple had gone. When Betsy asked him to give a quick appraisal of the ring, the truth came out. Betsy was quite upset that she had been taken in so easily.

"Were they driving an old blue Dart?" Andy asked the crowd.

"Yes!" Betsy screamed. "They took US-50 East toward Salida."

"Where's Salida?" Sue asked.

"Using the grid on the highway map, Salida is in **27 [HM]**."

"How far is it from Gunnison to Salida?" Dirk asked as he hopped into the Lexus.

"**28 [HM]** miles," Holly answered.

"It shouldn't be long before we catch up to them. This Lexus is much faster than their old Dart."

They caught up with the Dart on the outskirts of Salida and forced it off the road. To their surprise, they found that the driver wasn't Harry. It was Hubert Hinkle. Hubert told them that he had traded his '57 Chevy for the Dart because the man had thrown in a winning lottery ticket worth \$10,000.00. The man had told Hubert that he couldn't turn the ticket in himself because he had fallen behind in his alimony payments. If he tried to get his money, he lamented, he would be thrown into jail. Hubert did inform them that he was beginning to wonder whether he had made such a good deal when he discovered that the Dart had to struggle on its way to the summit of Monarch Pass.

"There's one born every minute," Sue remarked.

"Which way did they go?" Andy asked Hubert.

"They were headed toward Canon City on US-50," Hubert replied.

As they drove away, Sue asked, "I didn't realize that Monarch Pass was that steep. What is the elevation at its summit?"

Holly answered, "Well, according to the highway map, Monarch Pass is **29 [HM]** feet in elevation."

Arriving in Canon City, they were forced to make a decision. Should they continue on US-50 or C-120? Having no clue, they randomly chose US-50. Upon approaching the intersection of US-50 and C-67, Andy spotted a State Patrolman parked to the side of the road. "Quick! Pull over," he shouted to Dirk.

Andy quickly got out of the car, approached the State Patrolman, flashed his badge, and asked, "Have you seen an old, beat-up '57 Chevy pass by in the past ten minutes or so?"

"As a matter of fact, I did," responded the officer. "Steam was pouring from its hood, but the driver kept right on going. He turned South on C-67."

"Thanks, Officer. The driver is an escapee from the minimum security prison in Hotchkiss. Gotta go."

"We're in luck," Andy shouted as he jumped into the Lexis. "Head South on C-67!" It seemed apparent that Harry was headed to New Mexico, so Dirk didn't hesitate at the intersection of C-67 and C-96. He simply maintained his Southward course.

As they approached the intersection of C-96 and C-165, everyone's attention was immediately drawn to the sight of steam billowing from the hood of the '57 Chevy, abandoned adjacent to the picnic area. A crowd of curious onlookers had gathered around the Chevy.

"Where are the driver and his passenger?" Dirk asked the crowd.

"They took off in my old Jeep, heading South on C-165. Traded this here ring and my Jeep for the old Chevy. I've always wanted a good fix-up '57. Now I got a neat ring, too."

From the juncture of C-96 and C-165, they could barely make out the summit of Greenhorn Mountain, the direction in which Harry and Donna were heading. Using a pro-

tractor and the summit of Greenhorn Mountain as a reference, Holly calculated the azimuth of their direction of travel **30 [HM]**.

"How would you state that same compass direction as a bearing?" quizzed Sue, who up to this time had remained quite passive.

"The bearing would be stated as **31 [HM]**," replied Holly.

Once they had driven deeper into the **32 [HM]** National Forest, Kirk stated it was time to make the capture. Just as he was closing in on the Jeep, a tractor pulling a hay wagon merged directly between the two vehicles. The road was too curvy to permit them to pass, so they were forced to remain behind the hay wagon, traveling all of 15 mph. Andy and Sue were visibly upset and were concerned that Harry might actually get away.

Five minutes later they spied the Jeep at the side of the road. Its right rear tire was as flat as a pancake. Harry and Donna were nowhere in sight.

"Where are we?" asked Sue.

"We just passed a billboard a few moments ago indicating that we are near a small town named Rye," replied Andy. "They must have gone there."

"I have the Rye Quadrangle," offered Holly.

"The high school athletic field [Rye, Sector 5] seems to be sloping," Dirk observed.

"The map shows a **33 [R]** foot contour running through the field, Holly said. "It's a/an **34 [R]** [A. index, B. intermediate, C. supplementary, D. depression] contour."

They stopped at the high school and stepped out of the SUV to look around.

"I seem to recall someone saying that the locals call C-165 by a special name. Is there some other name for C-165 found on the Rye Quad?" Sue asked.

"Well, the name **35 [R]** is printed along the road. That could be it," replied Holly.

"I see a church," Dirk said. "It's less than 0.5 miles away at an azimuth of **36 [R]**."

"Dirk, don't forget. I used star north to determine the azimuth. If you use the SUV's compass, you'll have to figure in the declination."

"What's the declination?"

"The declination between star north and magnetic north is **37 [R]** degrees."

"The map shows that the **38 [R]** Cemetery is next to the church. Do you think they may be hiding there?"

"No," Sue responded. "Harry never goes near churches or cemeteries."

Still peering through his binoculars, Andy said, "About a half mile South of the church is a fish hatchery. I can make out two figures running South toward a road. I'll bet anything that those two people are Harry and Donna."

"Head for the Lexus!" Dirk shouted.

"We'll be waiting for them when they get to the road."

Departing the high school, they turned South on the main street of Rye. It was named **39 [R]** Avenue. After traveling about a mile, they turned left and drove nearly a mile further to a gravesite [SW ¼ SW ¼ Sec 32 T24S—R67W]. Here they waited. Having nothing better to do while waiting, Holly calculated the elevation of the grave as **40 [R]** feet. The reference datum for this vertical measurement is **41 [R]** [true for nearly all USGS quads].

Andy was the first to spot Harry and Donna climbing over the bank of **42 [R]** Creek, about 500 feet North of the grave. Dirk put the Lexus in four-wheel drive and headed for the creek.

Harry saw them coming and, along with Donna, scrambled back into the creek and swam across. Once on the other side, they ran toward the hatchery.

Dirk underestimated the depth of the creek and, even though it made it across, the Lexus died on the bank. Dirk, Holly, Andy, and Sue abandoned the soggy SUV to run after Harry and Donna.

Harry and Donna almost made it to the fish hatchery, but years of poor diet and lack of physical exercise had taken its toll. They fell to the ground, totally exhausted and unable to get up.

Andy was first to reach Harry and Donna. Holly was the last to arrive, probably because she was carrying the maps and a cell phone.

"What are we going to do now?" Sue lamented. "Our vehicle is non-functioning, and these two are much too tired to walk."

"According to the Rye Quadrangle Map, we are at the SE graticule tic mark. It's coordinates are **43 [R]** North and **44 [R]** West. Use the cell phone to call the prison. Ask them to dispatch the helicopter. It should be back from its pizza run by now."

An hour later Harry and Donna were airlifted back to jail, but not before Harry once more attempted to buy his freedom by offering them 10,000 shares of Eureka Gold Mining Company stock.

Totally exhausted and famished, the four jubilant detectives walked to town. First, they requested a tow truck for the Lexus. Then they headed straight for McDonald's and ordered the largest, tastiest and thickest milk shakes available to celebrate their successful capture of Harry and Donna.



**1999 National Science Olympiad**  
**Harry's Bid for Freedom**  
**Answer Key**

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| <ol style="list-style-type: none"><li>1. C [30]</li><li>2. Sunlight Ski Area</li><li>3. C [4-Lane Divided]</li><li>4. Campsites</li><li>5. 69</li><li>6. C [1 hr. 45 min.]</li><li>7. 1: 24,000</li><li>8. 20 feet</li><li>9. A [7.5]</li><li>10. Baxter Reservoir</li><li>11. 8 [or S]</li><li>12. NE ¼ Sec 9 T15S-R92W</li><li>13. North Fork Gunnison River</li><li>14. B [SW]</li><li>15. Field checked</li><li>16. County Fairground</li><li>17. 5740' and 5760'</li><li>18. C [Gradually increased]</li><li>19. A [Intermittent]</li><li>20. *38° 45' 47" to 38° 45' 52" [38°<br/>45' 52"]</li><li>21. *107° 40' 04" to 107° 40' 14"<br/>[107°40' 09"]</li><li>22. B [Orchard]</li><li>23. C [Unimproved dirt]</li><li>24. 47 miles</li><li>25. Grand View Mesa</li><li>26. 7703'</li><li>27. G-7</li><li>28. 65</li><li>29. 11,312 feet</li><li>30. 155° ± 2°</li><li>31. *S 25° E ± 2°</li></ol> | <ol style="list-style-type: none"><li>32. San Isabel</li><li>33. 6760</li><li>34. B [Intermediate]</li><li>35. Frontier Pathways Highway Byway</li><li>36. 107° ± 3°</li><li>37. 10 ½ °</li><li>38. Brookside</li><li>39. Boulder Avenue</li><li>40. *6640' – 6680''</li><li>41. Sea Level</li><li>42. Graneros Creek</li><li>43. 37° 55' N</li><li>44. 104° 55" W</li></ol> |
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For information on how to quickly obtain a set of USGS Quads plus the Highway Map for **Harry's Bid for Freedom**, plus other coaching aides, visit the following site:

<http://www.otherworlds-edu.com>

**Code Name COBRA**, another free, downloadable Road Scholar exam located on this web site uses the same set of Quads plus highway map as the exam – Harry's Bid for Freedom.

**1999 National Science Olympiad  
Harry's Bid for Freedom  
Student Answer Sheet**

Participants: \_\_\_\_\_ and \_\_\_\_\_

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Total Number of Correct Responses: \_\_\_\_\_