



FERMI QUESTIONS
 MINNESOTA REGIONALS 2007
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Team Number _____
 School Name _____
 Total Points _____

For each item, answer the quantity as the nearest integral power of ten. For example, if the number is 1.4×10^6 , you record 6 as your answer. If it is 8.6×10^3 , you record 4. **No calculators or resources allowed.**

SCORING: If the response is = to the accepted value, then it receives 5 points. If the response is ± 1 of the accepted value, then it receives 3 points. If the response is ± 2 of the accepted value, then it receives 1 points. Ties are broken by counting the highest number of answers which received 5 points (then 3 points if still a tie).

	Answer	Points
1. How many actual Science Olympiad medals will be given out at this regional competition today?		5 3 1 0
2. What is the value of $\ln(100)$?		5 3 1 0
3. What is the value of e^{100} ?		5 3 1 0
4. What is the value of $10!$ (that's "ten factorial")?		5 3 1 0
5. How many dollars would a one-gallon container full of pennies be worth?		5 3 1 0
6. How many golf balls would fit in an Olympic size swimming pool?		5 3 1 0
7. How many grams of sugar would be in an Olympic size swimming pool filled with Mountain Dew (not diet)?		5 3 1 0
8. If the historical "shot heard around the world" could indeed be heard around the world. How many minutes would it take?		5 3 1 0
9. How many centimeters does a fingernail grow in one second?		5 3 1 0
10. How many electrons pass through the cross sectional area of a wire in 3 hours if it carries a D.C. electric current of 10 Amps.		5 3 1 0
11. If you went on vacation to Las Vegas and spent 1 night in each hotel room in town, how many years would your vacation be?		5 3 1 0
12. And at today's prices, how many dollars would it cost you to rent all the rooms in Problem 11?		5 3 1 0
13. How many K-12 schools (public, private, and parochial) are there in MN?		5 3 1 0
14. How many kids graduated from MN high schools in 2005?		5 3 1 0
15. How many years does it take for sunlight to reach Earth?		5 3 1 0

	Answer	Points
16. What is the cost (in dollars) of all 2005-model year passenger vehicles sold in the United States?		5 3 1 0
17. What fraction of the United States is covered by the vehicles purchased in Problem 16?		5 3 1 0
18. How many sheets of $8\frac{1}{2}'' \times 11''$ paper are produced from one tree?		5 3 1 0
19. How many carbon atoms are in the graphite of a new #2 pencil?		5 3 1 0
20. How many hot dogs will be eaten at all major league baseball games during a one year season?		5 3 1 0
21. If you stacked the number of \$1 dollar bills equal to the U.S. national debt, how high (meters) would the stack be?		5 3 1 0
22. How many bits of information can be stored on a standard CD-ROM?		5 3 1 0
23. If the average roll of scotch tape has an outer radius of $1\frac{1}{16}$ inch and an inner radius of $\frac{11}{16}$ inch and is 27.7 yards long, estimate the thickness of a piece of tape, in inches, when applied to a surface.		5 3 1 0
24. If a $33\frac{1}{3}$ rpm (revolutions per minute) phonograph record has an outer diameter of 6 inches and the music stops at an inner diameter of $2\frac{1}{2}$ inches, and the music plays for 23 minutes, estimate the length of the groove in the record in feet.		5 3 1 0
25. What is the hydrogen ion concentration in water?		5 3 1 0
26. What is the probability of one randomly produced Power Ball ticket winning the jackpot?		5 3 1 0
27. What is the value of $100 + \frac{1}{100 + \frac{1}{100 + \frac{1}{100 + \frac{1}{100 + \frac{1}{100 + \dots}}}}}$?		5 3 1 0
28. What is the value of $\sqrt{100 + \sqrt{100 + \sqrt{100 + \sqrt{100 + \sqrt{100 + \sqrt{100 + \sqrt{100 + \dots}}}}}}}$?		
29. How many accordionists are there in the United States?		
30. How many people wrote this event?		