Energizing Your High School Math Team

Free and Low-Cost Opportunities for Math Teams

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Outline

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- Travel costs!
- Prep and practice costs (copying, etc)

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- Each range from $30 to $100
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Have No Money? Only a Little Money?
Here's what you can do . . .

Free and Low-Cost Contests

Rocket City Math League – FREE

- Four rounds
  First round: "Inter-School" Contest for Junior (below 9th grade) and Senior divisions
  Three rounds of topic tests (pre-alg, alg I, geo, alg II, above)

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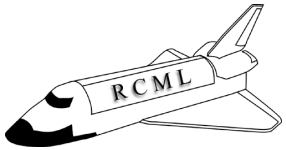
- Deadline to register is in November
- `http://www.rocketcitymath.org`

Sample RCML Test

Name_____



Rocket City Math League

Discovery (Pre-Calculus and Above) Test

2008-2009
Round 1

Answers must be written inside the adjacent answer boxes. All answers must be written in exact, reduced, simplified, and rationalized form. All decimals and mixed numbers must be written as improper fractions unless otherwise specified. **No calculators, books, or other aides may be used. You will be allowed 45 minutes to complete the test.**

1. Each point on this test should take the same amount of time, and it is a 45 minute test. If you spend 15 minutes on the first 5 questions, how many more seconds have you used than you should have on the first five questions? *(1 point)*	
2. The fierce and futuristic nation of Belligero is planning a bombing raid on the nation of Tranquilica. The Belligero air force plans to head out from their base at Malvokstreif and attack the city of Rose 288 miles directly to the South. The next target is the city of Utopia, 84 miles directly west of Rose. After the attack there, the airplanes will straight back to Malvokstreif. If the planes fly at a constant speed of 1680 miles per hour and spend 1 hour at each of the two cities, how long will the whole trip take in minutes? *(1 point)*	
3 Find the sum of all real x that satisfy the equation $\|x^2 - 3\| = \|3x+1\|$. *(1 point)*	
4. Joe Schmoe is down on his luck economically and, in his desperation, he robs the Safeguard Bank in his local town. Fearing that he will be caught with the money, Joe cleverly decides to invest the $3500 he stole in the very bank he robbed! If the bank compounds at a nominal annual rate of 8% compounded semiannually, how much money (in dollars and cents) will he be able to withdraw when he flees the country in exactly one year from when he deposited the money**?** *(1 point)*	
5. Zordac is in need of a new ship to replace the one he crashed. He finds a dealership that will sell him a ship for $\frac{3}{\log_3 8} \times \frac{2}{\log_4 9} \times (\log_5 4 \times \log_6 5 \ldots \times \log_{8192} 8191)^{-1}$ glorks. If he has 52 glorks, what percent of his glorks would he have to spend to buy the ship? *(2 points)*	

Free and Low-Cost Contests

PurpleComet! Math Meet – FREE

- Team-oriented, 90-minute contest in April
- Problems retrieved and solutions submitted on-line
- `http://purplecomet.org`

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Mu Alpha Theta's Log 1 Contest – FREE

- Three rounds, each on a specific topic
- This year's topics:
  Round 1 - Sequences/Series or Functions
  Round 2 - Matrices/Vectors or Equations/Inequalities
  Round 3 - Miscellaneous topics
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- Participants must be members of MAΘ
- Deadline...? First contest is in December
- `http://www.mualphatheta.org`

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- `http://math.kennesaw.edu/~ckoppelm/`

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Other FREE math contests

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- Art of Problem Solving's For the Win!
- U.S. High School National Mathematics Championship
  `http://www.ascm.org/`

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- Inexpensive registration fees:
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- State Math Tournament is free

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Typical Fundraising Ideas

- Car wash
- Tutoring services
- “Pi” sale
- others. . .

Best Fundraiser!

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- National Assessment & Testing offers a pre-packaged tournament for grades 4-8
  - "Middlementary Math Bonanza"
  - $200 fee
  - `http://www.natassessment.com/`

Some Suggestions

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  - Math League
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- Purchase some books
  - "The Art of Problem Solving" Volumes 1 & 2
  - "First Steps for Math Olympians"
  - Contest problem books: AMC, ARML, GCTM

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- Easily adapt old tournaments/contests to create your own
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Rockdale Contest Round 2

Math Team Contest Problems

SECOND ROUND

2.1 In right triangle ABC, angle C is the right angle. The altitude from C is constructed to side AB, where it intersects it at D. Given that $AD = 9$, and that $DC = 12$, find the area of triangle ABC.

2.2 Compute the following sum: $1^2 - 2^2 + 3^2 - 4^2 + \cdots - 100^2$.

2.3 $ABCDEF$ is a regular hexagon of side length 8. A new regular hexagon $GHIJKL$ is constructed by connecting the midpoints of consecutive sides of $ABCDEF$. What is the area of the new hexagon $GHIJKL$? Give your answer in simplified radical form.

2.4 The physicists at Imaginary Equipment Inc. have developed a superball that bounces up 99.99% of the distance from which it was dropped, on any surface. In the laboratory, the scientists accidentally left it bouncing straight up and down and forgot about it. Assuming that nothing impeded its bouncing, and that it was initially dropped at a height of 4 inches, how many inches will this ball travel? Round your answer to the nearest integer.

2.5 Triangles ABC, DEF, and GHI are all similar to each other. Triangle GHI is a right triangle, with angle G being the right angle. In triangle DEF, $DE = 15$ and $EF = 17$. If the area of triangle DEF is half of the area of triangle ABC, and the area of triangle ABC is eight times that of triangle GHI, what is the

Seminars

- Teach fascinating topics not in the curriculum
  - Modular arithmetic
  - Counting paths and combinatorics
  - Binary/octal/hexadecimal
  - Advanced geometry (Stewart's theorem, etc)
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  - Graph theory

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- Much like a "math circle"

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Brand your Math Team

Thank you!

This presentation, with active hyperlinks, will be posted at

`http://web.me.com/drcgarner`

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