

Categories for Round I:

Really Important (real constants given by a decimal expansion)

Named Calculus Theorems

Discrete Structures

Function of x

It's Logical

Really Important (real constants given by a decimal expansion)

- 1) What is π ?
- 2) What is e ?
- 3) What is the golden ratio (or ϕ , or $(1+\sqrt{5})/2$)?
- 4) What is $\sqrt{2}$ (or Pythagoras's Constant)?
- 5) What is the Euler-Mascheroni Constant (or γ)?

Named Calculus Theorems

- 1) What is the Chain Rule?
- 2) What is the Extreme Value Theorem?
- 3) What is the Fundamental Theorem of Calculus?
- 4) What is Fermat's Theorem?
- 5) What is Fubini's Theorem?

Discrete Structures

- 1) What is a graph?
- 2) What is a permutation?
- 3) What is a poset (or partially ordered set)?
- 4) What is a partition (of S)?
- 5) What is a generating function?

Function of x

- 1) What is square root?
- 2) What is \log (or logarithm, or " \ln ")?
- 3) What is tangent (or \tan)?
- 4) What is the error function (or erf)?
- 5) What is hyperbolic cosine (or \cosh)?

It's Logical

- 1) What is exclusive or (or xor)?
- 2) What is the Continuum Hypothesis?
- 3) What is a model?
- 4) What are the Axiom of Choice, Zorn's Lemma, and the Well-Ordering Principle? (Two of these suffice)
- 5) What are the Peano axioms (or the Dedekind–Peano axioms, or the Peano postulates, or Peano arithmetic)?

Categories for Round II:

Shapes

Number Theorems (theorems from Number Theory)

Favorite Groups (names, not notations, of important groups)

Differentiate This You are to differentiate the given expression.

Correct questions will be of the form "What is the integral of...?"

Strange Ways (names of surprising phenomena)

Shapes

- 1) What is a pentagon?
- 2) What is a sphere?
- 3) What is a torus?
- 4) What are ellipse, parabola, and hyperbola?
- 5) What is a hypercube?

Number Theorems (theorems from Number Theory)

- 1) What is the Fundamental Theorem of Arithmetic?
- 2) What is Fermat's Little Theorem?
- 3) What is Fermat's Last Theorem (or Wiles' Theorem)?
- 4) What is the (Law of) Quadratic Reciprocity?
- 5) What is the Green-Tao Theorem?

Favorite Groups (names, not notations, of important groups)

- 1) What is the Dihedral Group?
- 2) What is a Cyclic Group?
- 3) What is the Symmetric Group?
- 4) What is the Klein Four-Group (or Klein Group, or Vierergruppe)?
- 5) What is the General Linear Group?

Differentiate This (answered "what is the integral of ...?")

- 1) What is the integral of $5x^4$?
- 2) What is the integral of $-\sin x$?
- 3) What is the integral of $1/(1+x^2)$?
- 4) What is the integral of $1/(x \log x)$?
- 5) What is the integral of $x^x (\log x + 1)$?

Strange Ways (names of surprising phenomena)

- 1) What are fractals?
- 2) What is the Banach-Tarski Paradox?
- 3) What is Godel's Incompleteness Theorem?
- 4) What is Cantor's Theorem?
- 5) What is the Halting Problem?

Final jeopardy: Geometry

1) What is 666?