

Lecture 6: Quiz

Name:

Problem 1

The sequence 1, 3, 6, 10, 15, 21, 28, ... has a name. Which one?

- a) Tetrahedral numbers. c) Fibonacci numbers.
 b) Triangular numbers. d) Harmonic numbers.

Problem 2

We have seen that Archimedes derived the volume of the sphere. How did he do it?

- a) Compute the integral $\int_0^1 1 - x^2 dx$
 b) Placed ball in bath and noticed water swap over. Then shouted Heureka!
 c) Exhaust the sphere with polyhedra and compute this volume.
 d) Compute the difference of the volumes of a cylinder and a cone.

Problem 3

Which of the following mathematicians was the first to ponder calculus questions?

- a) Archimedes e) Galileo
 b) Leibniz f) Hooke
 c) Newton g) Fermat
 d) Gregory h) Zeno

Problem 4

A) Gauss had to compute is the sum of the first 100 natural numbers 1-100? What was the result?

- a) 550
 b) 5050
 c) 500501
 d) 5051

B) What is the next element in the sequence 2, 10, 30, 68, 130, 222, 350, ...?

- a) 520
 b) 500
 c) 485
 d) 480

Problem 6

a) What is the theory deals with discontinuities, especially with disappearances of stable minima?

Answer:

b) We looked at the end at a domino problem: How wide can a bridge be made with dominos?

Answer:

c) We mentioned that calculus can be used to show that π has a property. Which?

Answer:

Problem 7

We showed a Presentation style called Pecha-Kucha. How long was that presentation?

- b) 20 seconds c) The entire lecture
 a) 6 minutes 40 seconds c) 20 Minutes

Problem 8

The two statements make up the fundamental theorem of calculus?

- a) $\int_0^x f'(t) dt = f(x) - f(0)$ c) $d/dx \int_0^x f(t) dt = f(x) - f(0)$
 b) $\int_0^x f'(t) dt = f(x)$ d) $d/dx \int_0^x f(t) dt = f(x)$

Problem 9

What can you say about the series $\sum_{k=1}^{\infty} 1/k$?

- a) It is the geometric series and converges. c) It is an unsolved problem.
 b) It is the harmonic series and diverges. d) The sum is equal to $\pi^2/6$.

Problem 10

Who was the guy who did Calculus in 20 minutes?

- a) Oliver in his Pecha Kucha c) Galois before he died in a duel
 b) Ed Burger d) Tom Lehrer