Lecture 9: Quiz

Name:

Problem 1

Which of the following letters are topologically equivalent to the number 5?

a) S
b) T
c) U
d) Q

Problem 2

Which problem triggered the development of graph theory?

a) The Petersburg paradox.
b) Finding the Euler characteristic of a polyhedron
c) The Koenigsberg bridge problem
d) The Poincaré conjecture

Problem 3

How many regular Platonic solids are there in four dimensions?

a) 6
b) 4
c) 12
d) 5

Problem 4

Which formula is called Euler's Gem?

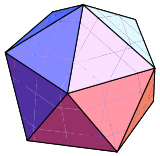
a) $E - F + V = 2$
b) $E - V + F = 0$
c) $E - V + F = 2$
d) $V - E + F = 2$

Problem 5

Which two mathematicians established first that there are 6 platonic solids in four dimensions?

a) Erasthothenes
b) Theaetetus
c) Alicia Boole Stott
d) Ludwig Schlaefli

Problem 6



Which Platonic solid is displayed in the picture?

a) Tetrahedron
b) Cube
c) Icosahedron
d) Octahedron

Problem 7

How many different semiregular nonprismatic polyhedra (Archimedian solids) are there in space?

a) 5
b) 6
c) 24
d) 13

Problem 8

Which of the following surfaces are orientable?

a) The torus
b) Sphere
c) The cone
d) Klein bottle

Problem 9

Which formula was used in the proof that there are exactly 5 platonic solids?

a) $1/m + 1/n = 1/2 + 1/e$ b) $a^2 + b^2 = c^2$ c) The number of edges is always even. d) The duality switching faces and vertices

Problem 10

What is the Euler characteristic of the sphere?

a) 2
b) 0
c) 1
d) -1