Lecture 5: Quiz

Name:

Problem 1

Who did use letters as variables of algebraic expressions first?
a) Francois Viete,   b) al-Khwarizmi   c) Archimedes   d) Arthur Cayley

Problem 2

The **quadratic equation**: $x^2 + bx + c = 0$ has two solutions x_1, x_2. Which identities are true?
a) $x_1 + x_2 = b$ b) $x_1 \cdot x_2 = -c$ c) $x_1 * x_2 = c$ d) $x_1 + x_2 = -b$

Problem 3

Check all the axions parts which are used to define a group:
a) There exists a unit 1
b) $1 \star x = x$ for all x
c) $x \star y = y \star x$
d) $x \star (y \star z) = (x \star y) \star z$
e) Every x has an inverse y satis-
fying $xy = 1$.

Problem 4

True or false? There is a closed formula for

a) solving the quadratic equation.
b) solving the cubic equation.
c) solving the quartic equation.
d) solving the quintic equation.

Problem 5

Who found a formula for the cubic equation by radicals?

a) Cardano, Tartaglia and del Ferro
b) One can not solve the cubic with radicals.
c) Kepler
d) Lodovico Ferrari

Problem 6

The group of all permutations of 4 elements has how many elements:
a) 4   b) 8   c) 16   d) 24

Problem 7

If we take a square ABCD and first reflect at the diagonal AC and then at the diagonal BD, then we get:

a) a reflection at the origin, b) a reflection at an axes c) the identity d) a rotation about 90 degrees

Problem 8

What is the world record for solving the Rubik cube?

a) 5.55 seconds   b) 5.66 seconds   c) 4.55 seconds   d) 20 seconds

Problem 9

a) Which of the choices A-F is the Meffert puzzle?
b) Which of the choices A-F is the Pyraminx cube.

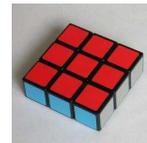A   B   C

D   E   F

Problem 10

In class we looked at the **floppy puzzle**. How many elements does this group have?

a) $4! \cdot 8 = 192$.
b) $9! = 362880$.
c) $4! \cdot 4! \cdot 2^4 = 9216$.
d) 12.