Lecture 5: Quiz

Name: 

Problem 1

The quadratic equation: \( x^2 + bx + c = 0 \) has two solutions \( x_1, x_2 \). By writing the equation as \((x - x_1)(x - x_2)\) we get relations allowing to check the solution. Which identities are true? a) \( x_1 + x_2 = b \)  
b) \( x_1 \cdot x_2 = -c \)  
c) \( x_1 \cdot x_2 = c \)  
d) \( x_1 + x_2 = -b \)

Problem 2

Check all parts which are used to define what a (not necessarily commutative) group is

a) \( 1 \star x = x \) for all \( x \)  
b) \( x \star y = y \star x \)  
c) \( x \star x = 1 \).  
d) \( x \star (y \star z) = (x \star y) \star z \)  
e) Every \( x \) has an inverse \( y \) satisfying \( xy = 1 \).  
f) \( x \star x = x \)

Problem 3

Who did use letters as variables of algebraic expressions first?  
a) Rene Descartes  
b) Arthur Cayley  
c) Francois Viete,  
d) Peano  
e) Bombelli

Problem 4

For which equations are there closed formulas?  
a) the quadratic equation.  
b) the cubic equation.  
c) the quartic equation.  
d) the quintic equation.  
e) the hextic equation.

Problem 5

Who found first a formula for the cubic equation by radicals?  
a) Cardano, Tartaglia and del Ferro  
b) One can not solve the cubic with radicals.  
c) Lodovico Ferrari  
d) Kepler
Problem 6

The 15 puzzle was invented by
a) a mathematician b) a post master c) a math teacher d) a dentist

Problem 7

How many elements does the symmetry group of a square have?

a) 8 (4 rotations and 4 reflections) b) 24 (all permutations of 4 elements) c) 4 (4 reflections) d) 2 (2 reflections)

Problem 8

What is the world record for solving the Rubik cube?

a) 5.25 seconds  b) 15.66 seconds  c) 3.55 seconds  d) 20 seconds

Problem 9

Which of the choices A-F is the Floppy puzzle?

A  B  C

Problem 10

What is the god number of the Rubik cube, the number of moves which allows to solve the cube?

a) 20.  b) 10.  c) unknown.  d) 6.