IST Ü11

5) X^2 - test for independence

	Uni A	Uni B	Uni C	Σ	$\alpha = 0,05$
calculus	10	5	5	20	
algebra	10	20	10	40	
probability	20	5	0	25	
Σ	40	30	15	85	

expected - table

	Uni A	Uni B	Uni C
calculus	$40 \cdot \frac{20}{85} = 9,4118$	$30 \cdot \frac{20}{85} = 7,0588$	$15 \cdot \frac{20}{85} = 3,5294$
algebra	$40 \cdot \frac{40}{85} = 18,8235$	$30 \cdot \frac{40}{85} = 14,1176$	$15 \cdot \frac{40}{85} = 7,0588$
probability	$40 \cdot \frac{25}{85} = 11,7647$	$30 \cdot \frac{25}{85} = 8,8235$	$15 \cdot \frac{25}{85} = 4,4118$

$\frac{(observed - expected)^2}{expected}$ - table

	A	B	C	
c	0,0368	0,6005	0,6128	Sum of this table is
a	4,136	2,451	1,2255	20,8955
p	5,7648	1,6568	4,4118	

$X^2(4)$ at the 95% quantile is 9,49 and since 20,8955 is larger we reject the null hypothesis (which says the preference for a lecture is independent from the university).