103-2 遺傳學 隨堂測驗 03　　姓名 _____ 學號 _____

1. In the following testcross, gene *a* and *b* are 30cM apart, and gene *b* and *c* are 20cM apart: *a+c/+b+* X *abc /abc.* If coefficient of coincidence is 0.4 over this interval on the linkage map, how many triply homozygous recessive individuals are expected among 1000 progeny? (30 points) (Note: Morgan's map function was used for genetic distance)

2. A geneticist conducted a study to map the loci *A*, *B*, *C*, *D*, and *E* , and made two three-point testcrosses involving various combinations of these loci:

Seriers 1	
AABBCCDDEE X *aabbCCddEE*	
F1 test-crossed to *aabbccddee*	
progeny	
ABCDE	316
abCdE	314
ABCdE	31
abCDE	39
AbCdE	130
aBCDE	140
AbCDE	17
aBCdE	13
	1000

Series 2	
AABBCCDDEE X *aaBBccDDee*	
F1 test-crossed to *aabbccddee*	
progeny	
ABCDE	177
aBcDe	161
ABcDe	180
aBCDE	173
ABCDe	89
aBcDE	68
aBCDe	71
ABcDE	81
	1000

Please use Chi-square test to validate the linked loci, and then draw the genetic map. (Please using Morgan's map function to show genetic distance). (70 points)

Critical values of the χ^2 distribution				
df	1	2	3	4
P=0.05	3.841	5.991	7.815	9.488