

# Drosophila Mapping Homework – Answer Key

## Problem 1

1 = c	based on the nonrecombinants Bsv & bSV cross = stubble vestigial x black
2 = d	Bsv & bSV = highest numbers
3 = b	BSv & bsV = lowest numbers
4 = b	S changed in the 2XO's
5 = e	$B - S = 100 \times (18 + 22 + 3) / 1250 = 3.44 \text{ cM}$
6 = a	$S - V = 100 \times (37 + 41 + 3) / 1250 = 6.48 \text{ cM}$
7 = d	$B - V = 3.44 + 6.48 = 9.92 \text{ cM}$
8 = a	observed 2XO's = $3/1250 = 0.0024$ expected 2XO's = $0.0344 \times 0.0648 = 0.0022$ coefficient of coincidence = $O/E = 0.0024/0.0022 = 1.09$
9 = d	interference = $1 - \text{c.c.}$ $1 - 1.09 = -0.09$
10 = b	negative interference

## Problem 2

11 = d	based on the nonrecombinants BsV & bSv cross = stubble x black vestigial
12 = c	BsV & bSv = highest numbers
13 = d	Bsv & bSV = lowest numbers
14 = c	V changed in the 2XO's
15 = c	$B - S = 2.51 + 4.4 = 6.91 \text{ cM}$
16 = d	$S - V = 100 \times (92 + 102 + 4) / 45000 = 4.4 \text{ cM}$
17 = a	$B - V = 100 \times (51 + 58 + 4) / 4500 = 2.51 \text{ cM}$
18 = c	observed 2XO's = $4/4500 = 0.00089$ expected 2XO's = $0.0251 \times 0.044 = 0.0011$ coefficient of coincidence = $O/E = 0.00089/0.0011 = 0.81$
19 = e	interference = $1 - \text{c.c.}$ $1 - 0.81 = 0.19$
20 = a	positive interference

## Problem 3

21 = b	based on the nonrecombinants BSv & bsV cross = vestigial x black stubble
22 = b	BSv & bsV = highest numbers
23 = a	bsv & BSV = lowest numbers
24 = c	V changed in the 2XO's
25 = a	$B - S = 4.1 + 2.51 = 6.91 \text{ cM}$
26 = d	$S - V = 100 \times (109+4) / 4500 = 2.51 \text{ cM}$
27 = b	$B - V = 100 \times (194 + 4) / 4500 = 4.40 \text{ cM}$
28 = e	observed 2XO's = $4/4500 = 0.00089$ expected 2XO's = $0.0251 \times 0.044 = 0.0011$ coefficient of coincidence = $O/E = 0.00089/0.0011 = 0.81$
29 = e	interference = $1 - \text{c.c.}$ $1 - 0.81 = 0.19$
30 = a	positive interference

## Problem 4

31 = b	ABd & abD
32 = b	Non Rec = $1500 - 85 - 37 - 2 = 1376$
33 = d	aBD & Abd
34 = b	$2XO = 0.058 \times 0.026 \times 1500 \times 0.85 = 1.92 = 2$
35 = c	AbD & aBd
36 = e	$A - B = (0.058 \times 1500) - 2 = 85$
37 = a	abd & ABD
38 = c	$B - D = (0.026 \times 1500) - 2 = 37$

**Problem 5**

39 = b	ABd & abD
40 = b	Non Rec = $1500 - 67 - 55 - 2 = 1376$
41 = c	aBd & AbD
42 = b	$2XO = 0.046 \times 0.038 \times 1500 \times 0.76 = 1.99 = 2$
43 = a	abd & ABD
44 = e	$D - A = (0.046 \times 1500) - 2 = 67$
45 = d	Abd & aBD
46 = d	$A - B = (0.038 \times 1500) - 2 = 55$

**Problem 6**

47 = b	ABd & abD
48 = d	Non Rec = $1500 - 66 - 36 - 2 = 1396$
49 = a	ABD & adb
50 = b	$2XO = 0.045 \times 0.025 \times 1500 \times 0.92 = 1.55 = 2$
51 = c	AbD & aBd
52 = a	$D - A = (0.045 \times 1500) - 2 = 66$
53 = d	abd & ABD
54 = d	$D - B = (0.025 \times 1500) - 2 = 36$