LZ, MELXUAN
1004457 Pset week 10

1. 7q36.1 150991056 to 151014599 No: Increase risk for coronary spasm
   3q24 148697871 to 148743003 Regulation of blood pressure
   ETV6 UGT1A1 HLA-C

2. a) Autosomal recessive as the affected skips generation and affected mother ~~can have~~ don't have affected sons.

   b) D^LD^L for affected individual
   D^LD^+ or D^+D^+ for ~~an~~ unaffected individual

   c) 1 D^LD^+
   2 D^LD^+
   3 D^LD^+ or D^+D^+
   4 D^LD^+

3. a) 0

   b) $\frac{2}{3}$ as there are 2 R^+R^m and 1 R^+R^+ given that E is not affected

   c) Since it's autosomal ~~res~~ recessive, to have an affected child, it must be R^mR^m, both R^m come from parents. Their genotypes have to be R^mR^+ together. And the chance to have R^mR^m is $\frac{1}{4}$. To calculate to final probability, $\frac{2}{3} \times \frac{2}{3} \times \frac{1}{4} = \frac{1}{9}$ #

   d) To let E be carriers, its genotypes should be R^+R^m one R^m and R^+ come from mother or father, there are three situations to fulfill the goal:

   ① R^mR^+ and R^+R^+ $\frac{2}{3} \times \frac{1}{3} \times \frac{1}{2}$
   ② R^+R^+ and R^mR^+ $\frac{1}{3} \times \frac{2}{3} \times \frac{1}{2}$
   ③ R^mR^+ and R^mR^+ $\frac{2}{3} \times \frac{2}{3} \times \frac{1}{2}$

   $\frac{1}{9} \times 2 + \frac{2}{9} = \frac{4}{9}$ #

4. a. 0.5

b. 0.5

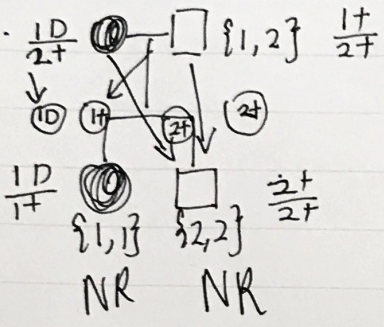
his husband: $X^{m}Y$

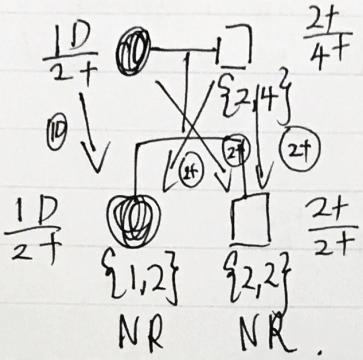
Martin: $X^{+}X^{m}$ or $X^{+}X^{+}$

	X^{m}	X^{+}
X^{+}	$X^{m}X^{+}$	$X^{+}X^{+}$
Y	$X^{m}Y$	$X^{+}Y$

Yes, if it's a son, it's always inherited. But if it's a daughter, it's safe all the time.

5.

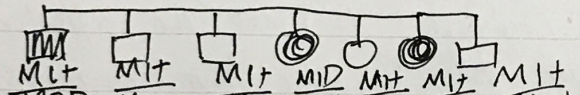




For each NR child: $LOD = \log_{10} \frac{(1-\theta)}{\frac{1}{2}} \cdot \frac{1}{\frac{1}{4}} \cdot 1 = 0.301$

6.

a.



b. $\log_{10} \frac{(\frac{1-0.1}{2})^5 (\frac{0.1}{2})^2}{(\frac{1}{4})^7} = -0.122$

c. $\log_{10} \frac{(\frac{1-0.2}{2})^5 (\frac{0.2}{2})^2}{(\frac{1}{4})^7} = 0.225$

d. LOD ≥ 3 represents there's linkage between RELP and 01

As seen in the chart, $LOD_{max} = 4.00$ $\theta = 0.05$, the genetic distance = 5 cM (100×0.05)

7. B

8. a) C A D B

b) D