Answer the question in the answer sheet.

1. An inbred strain of plants has a mean height of 24 cm. A second strain ofthe same species from a different country also has a mean height of 24cm. The F1 plants from a cross between these two strains are also 24 cmhigh. However, the F2 generation shows a wide range of heights; themajority are like the P1 and F1 plants, but approximately 4 of 1000 areonly 12 cm high, and 4 of 1000 are 36 cm high.
(a) What mode of inheritance is occurring here?
(b) How many gene pairs are involved?
(c) How much does each gene contribute to the plant height?
(d) Indicate one possible set of genotypes of the P1 and F1
plants that could explain their heights.
(e) Indicate one possible set of genotypes to account for F2 plants that are 18 cm or 33 cm high

2. Marian's father is colorblind, as is her maternal grandfather (her mother's father). Marian herself has normal color vision. Marian and her husband, Martin, who is also colorblind, have just had their first child, a son they have named Mickey. Please answer the following questions about this small family.
a.What is the probability that this child will be colorblind?
b.Three sources of the colorblindness allele are mentioned in this family. If Mickey is colorblind, from which of these three men (Marian's grandfather, Marian's father, or Martin) did he inherit the allele?

3. An individual is heterozygous for four genes, named a, b, c and d. The mutations are recessive. This individual is test-crossed with another individual who is homozygous recessive for all 4 traits. 1,000 progeny are found as follows:

phenotype	progeny
$ab^+c^+d^+$	42
a^+bcd	43
$a^+b^+c^+d$	140
$abcd^+$	145
ab^+cd^+	6
a^+bc^+d	9
a^+b^+cd	305
abc^+d^+	310

Which genes, if any, are linked?