

DIRECTORATE SENIOR CURRICULUM MANAGEMENT (SEN-FET)

GRADE 12 LIFE SCIENCES HOME SCHOOLING SELF-STUDY WORKSHEET 5 ANSWER SHEET

	LIFE SCIENCES	GRADE	12	DATE	14/04/2020
SUBJECT					
	PEDIGREE DIAGRAMS	TERM 1		TERM 2	✓
TOPIC		REVISION		CONTENT	

1.1	1.1.1	B√√	(2)
	1.1.2	C√√	(2) (4)
2.1	2.1.1	100%√	(1)
	2.1.2	Non-haemophiliac female ✓ / normal female	(1)
	2.1.3	(a) X ^h Y✓	(1)
		(b) X ^H X ^h √√	(2) (5)

2.2 2.2.1 (a) $X^{A}Y \checkmark \checkmark$ (2)

(b) $X^A X^a \checkmark \checkmark$

2.2.2 $3/7 \times 100 = 42.8 \times /42.9/43\%$ (2)

- 2.2.3 An affected female carries two/only recessive alleles √/X^aX^a
 - Sons/males inherit one X chromosome√ from their mothers
 - Sons/males need only one recessive allele to be affected√
 - and therefore must inherit $X^{\boldsymbol{a}}$ from their mother \checkmark

Any 3 (3) **(9)**

2.3 2.3.1 (a) Colour blind malec√ /male with Daltonism (1)

(b) $X^{D}X^{d}\checkmark$

- 2.3.2 Linda inherited one recessive allele/X^d from her father√ (2)
 - and one recessive allele/X^d from her mother ✓
- 2.3.3 Males only have one X-chromosome✓
 - If this chromosome carries the recessive allele √ /X^d
 - the male will be colour blind√
 - Females have 2 X-chromosomes√
 - -They need to have two recessive alleles √/X^d X^d to be affected A dominant allele on the other X-chromosome will mask the effect √ (4) Any 4



Phenotype Normal female Normal male ✓ P₁ X_DX_q Genotype X^DY ✓ Х Meiosis G/gametes X^D , X^d X^D.Y√ Fertilisation Genotype F₁

> Normal females, Phenotype

Normal male. Colour blind male.

P₁ and F₁√

Meiosis and fertilisation√

OR

Phenotype P₁ Normal female Normal male √ Χ $X^{D}X^{d}$ X^DY ✓ Genotype Χ

Meiosis

Fertilisation

Gametes	Χ ^D	Υ
ΧD	X_DX_D	X ^D Y
Xq	X_DX_q	Χ ^d Y

1 mark for correct gametes√ 1 mark for correct genotypes√*

F₁ Phenotype Normal females,

Normal male, Colour blind male

 P_1 and

(6) F₁✓ (14)

Meiosis and fertilisation√

2.4 2.4.1		(a) Suffers from Huntington's ✓ chorea	(1)
		(b) (b) hh√	(1)
	2.4.2	hh√	(1)
	2.4.3	 Emma's genotype is Hh √/heterozygous The father's genotype has to be hh√/homozygous recessive 	

- a cross between only these two genotypes / /(Hh and hh) will

ensure that there is 50% chance of the child not inheriting the disease

(3)**(6)**

[38]