

Question 21 (2 marks)

Gregor Mendel and Thomas Morgan both used breeding experiments to deduce fundamental principles of genetics.

Complete the four blank boxes in the table.

	Mendel's Monohybrid Cross	Morgan's Fruit Fly Experiments																		
First Cross Parents Phenotype	tall × short	red eyed female × white eyed male																		
First Cross (F ₁) Parents Genotype	$TT \times tt$	$X^R X^R \times X^r Y$																		
First Cross Punnet Square	<table style="margin-left: auto; margin-right: auto;"> <tr> <td></td> <td>t</td> <td>t</td> </tr> <tr> <td>T</td> <td>Tt</td> <td>Tt</td> </tr> <tr> <td>T</td> <td>Tt</td> <td>Tt</td> </tr> </table>		t	t	T	Tt	Tt	T	Tt	Tt	<table style="margin-left: auto; margin-right: auto;"> <tr> <td></td> <td>X^r</td> <td>$X^r Y$</td> </tr> <tr> <td>X^R</td> <td>$X^R X^r$</td> <td>$X^R X^r Y$</td> </tr> <tr> <td>X^R</td> <td>$X^R X^r$</td> <td>$X^R X^r Y$</td> </tr> </table>		X^r	$X^r Y$	X^R	$X^R X^r$	$X^R X^r Y$	X^R	$X^R X^r$	$X^R X^r Y$
	t	t																		
T	Tt	Tt																		
T	Tt	Tt																		
	X^r	$X^r Y$																		
X^R	$X^R X^r$	$X^R X^r Y$																		
X^R	$X^R X^r$	$X^R X^r Y$																		
F ₁ Phenotype	Tt, Tt, Tt, Tt	$X^R X^r, X^R X^r Y$																		