

0 3

Sperm cells and egg cells are formed by meiosis.

0 3 . 1

During meiosis a cell divides twice.

How many sperm cells are formed when a cell divides by meiosis?

[1 mark]

0 3 . 2

Human body cells contain 46 chromosomes.

How many chromosomes are in each human egg cell?

[1 mark]



Dupuytren's is a disorder that affects the hands.

One form of Dupuytren's is caused by a dominant allele (**D**).

The allele for **not** having Dupuytren's is recessive (**d**).

0 3 . 3 What is an allele?

[1 mark]

Tick (✓) **one** box.

A different form of a chromosome

A different form of a gamete

A different form of a gene

0 3 . 4 A man with Dupuytren's has the genotype **Dd**.

Which word describes the man's genotype?

[1 mark]

Tick (✓) **one** box.

Heterozygous

Homozygous

Phenotype

Question 3 continues on the next page

Turn over ►



The man with Dupuytren's (**Dd**) and a woman who does **not** have Dupuytren's (**dd**) plan to have a child.

- 0 3 . 5** Complete the genetic diagram in **Figure 4** to show the possible genotypes of the child.

[2 marks]

Figure 4

		Woman	
		d	d
Man	D	Dd	
	d		

- 0 3 . 6** Draw a ring around the genotype of a child in **Figure 4** who will have Dupuytren's.

[1 mark]

- 0 3 . 7** What is the chance of the child having Dupuytren's?

[1 mark]

Tick (✓) **one** box.

25% 50% 75% 100%



0 3 . 8 A genetic disorder develops as a result of a change in a gene.

What scientific term describes a change in a gene?

[1 mark]

0 3 . 9 People with a family history of some genetic disorders are offered embryo screening.

Suggest **one** way embryo screening can help people with a family history of a genetic disorder.

[1 mark]

10

Turn over for the next question

Turn over ►



Question	Answers	Extra information	Mark	AO / Spec. Ref.									
03.1	4 / four		1	AO1 4.6.1.2									
03.2	23 / twenty three	do not accept 23 pairs	1	AO1 4.6.1.2									
03.3	a different form of a gene		1	AO1 4.6.1.6									
03.4	heterozygous		1	AO2 4.6.1.6									
03.5 mark with 3.6 and 3.7	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td>Dd / dD</td> </tr> <tr> <td></td> <td>dd</td> <td>dd</td> </tr> </table>						Dd / dD		dd	dd	allow 2 correct for 1 mark	2	AO2 4.6.1.1 4.6.1.2 4.6.1.6
		Dd / dD											
	dd	dd											
03.6 mark with 3.5 and 3.7	ring around any Dd	allow ecf from question 03.5	1	AO2 4.6.1.6									
03.7 mark with 3.5 and 3.6	percentage must match answer given to questions 03.5 and 03.6	if no answer in question 03.5 allow 50 %	1	AO3 4.6.1.6									
03.8	mutation / mutated	do not accept mutant	1	AO1 4.6.2.1									

<p>03.9</p>	<p>any one from:</p> <ul style="list-style-type: none"> • to help them prepare • to inform whether to consider having an abortion • to find out if they have passed on the disorder 	<p>allow to see if the child / embryo has the disorder</p> <p>allow answers referring to genetic disorders, or specific example such as Dupuytren's / cystic fibrosis</p>	<p>1</p>	<p>AO3 4.6.1.7</p>
<p>Total</p>			<p>10</p>	