

Inheritance

IGCSE Biology Topical Questions Paper 1

May/June 2003

30 The nucleus in each cell in the stem of a plant contains 32 chromosomes.

How many chromosomes are there in the nuclei of its pollen grains?

- A 8
- B 16
- C 32
- D 64

31 A heterozygous, brown-eyed woman and a blue-eyed man have a child.

If the allele for brown eyes is dominant to the allele for blue eyes, what are the chances that the child is blue-eyed?

- A 1 in 2
- B 1 in 3
- C 1 in 4
- D none

32 A female fruit fly with short wings mates with a male with long wings. All the offspring are long-winged.

Two of these offspring mate with each other.

What percentage of their offspring will have long wings?

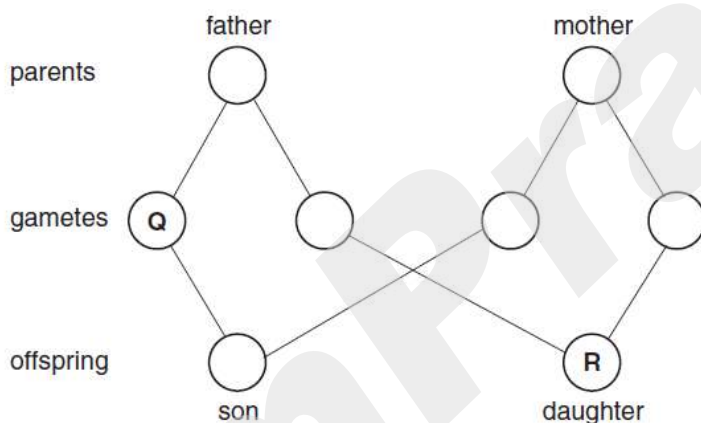
- A 25 %
- B 50 %
- C 75 %
- D 100 %

Oct/Nov 2003

29 Which terms describe the nucleus in the gametes and in the zygote of a human?

	gametes	zygote
A	diploid	diploid
B	diploid	haploid
C	haploid	diploid
D	haploid	haploid

31 The diagram shows the fusion of gametes to produce a son and a daughter.



What are the sex chromosomes in gamete **Q** and daughter **R**?

	Q	R
A	X	XX
B	X	XY
C	Y	XX
D	Y	XY

May/June 2004

29 Which shows the sex chromosomes in the body cells and in the sex cells in a man?

	body cells	sex cells
A	XX	all X
B	XX	all XX
C	XY	X or Y
D	XY	all XY

31 In a certain plant, the allele for white fruit, W, is dominant over the allele for yellow fruit, w.

A white-fruited plant was crossed with a yellow-fruited plant. About half of the offspring were white-fruited and the other half were yellow-fruited.

Which genotypes did the parent plants have?

- A ww and ww
- B Ww and ww
- C WW and ww
- D WW and Ww

Oct/Nov 2004

27 Which defines the development of an organism?

- A increase in age
- B increase in complexity
- C increase in dry mass
- D increase in height or length

29 A couple have two daughters and then three sons. They are expecting another child.

What is the chance of this child being a boy?

- A** 0% **B** 25% **C** 50% **D** 75%

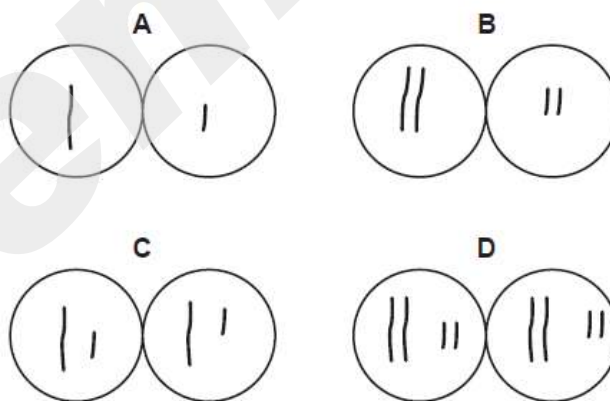
30 Which sex chromosomes must be present in sperm and ovum for normal fertilisation leading to the development of a male child?

	sex chromosomes in sperm	sex chromosomes in ovum
A	X	X
B	Y	X
C	XX	XX
D	XY	XX

31 The nucleus of a cell contains two pairs of chromosomes.



Which two nuclei are produced after mitosis?



32 In fruit flies, the allele for grey body, G, is dominant over the allele for black body, g.

The result of a mating between two flies is shown.

(parents) grey-bodied fly x black-bodied fly



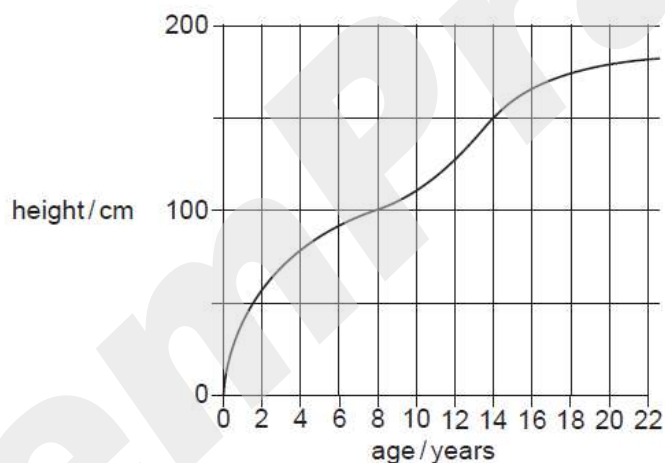
(offspring) 33 grey-bodied flies + 38 black-bodied flies

What were the genotypes of the parents?

- A** Gg x gg **B** Gg x Gg **C** GG x gg **D** GG x Gg

May/June 2005

31 The graph shows how human height changes with age.



In which age range is growth fastest?

- A** 0–2 years
B 8–10 years
C 12–14 years
D 20–22 years

33 A family has three daughters. The mother is pregnant for the fourth time.

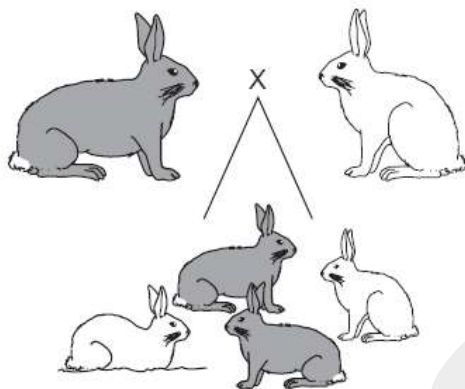
What is the chance of the fourth child being a son?

- A** 25% **B** 50% **C** 75% **D** 100%

Oct/Nov 2005

32 In rabbits, the allele for dark fur, R, is dominant to the allele for white fur, r.

The diagram shows a cross between a rabbit with dark fur and a rabbit with white fur.



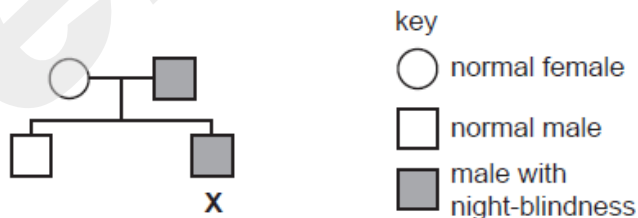
What are the genotypes of the offspring?

- A all Rr
- B RR and rr
- C RR and Rr
- D Rr and rr

May/June 2006

29 Night-blindness is an inherited condition, caused by a dominant allele.

The chart shows how this condition was passed on in one family.

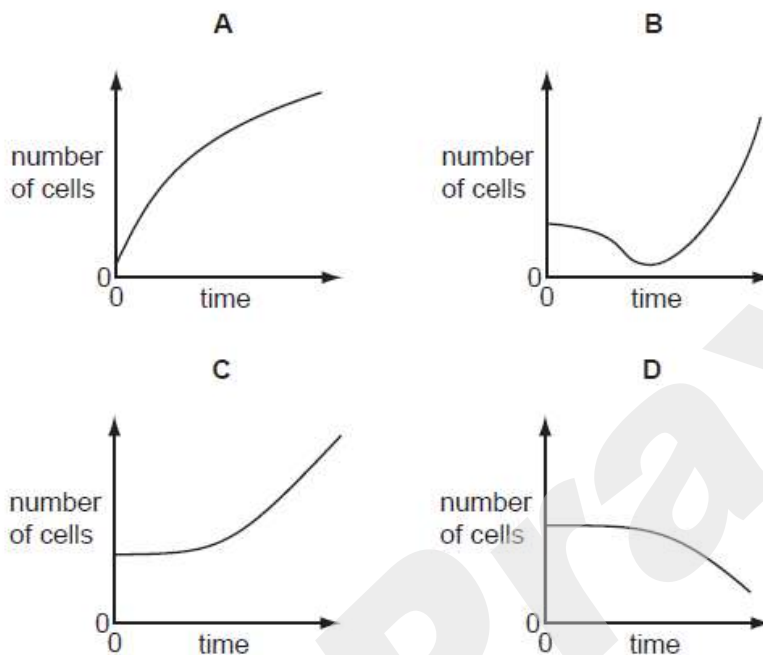


Person X marries someone with normal sight.

What is the chance that their first child will have night-blindness?

- A 0%
- B 50%
- C 75%
- D 100%

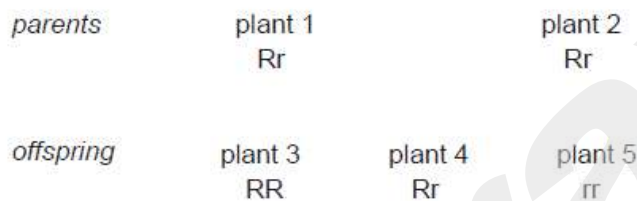
30 Which graph shows the change in the number of cells from the start of germination in a seed until the seedling starts to photosynthesise?



31 Why does meiosis occur during the formation of gametes?

- A It allows the number of gametes to be doubled.
- B It prevents asexual reproduction occurring in the life cycle.
- C It prevents variations appearing in the phenotype.
- D It produces haploid gametes in preparation for fertilisation.

32 The diagram shows the genotypes of two parent plants and three of their offspring for a characteristic that is controlled by a dominant allele.



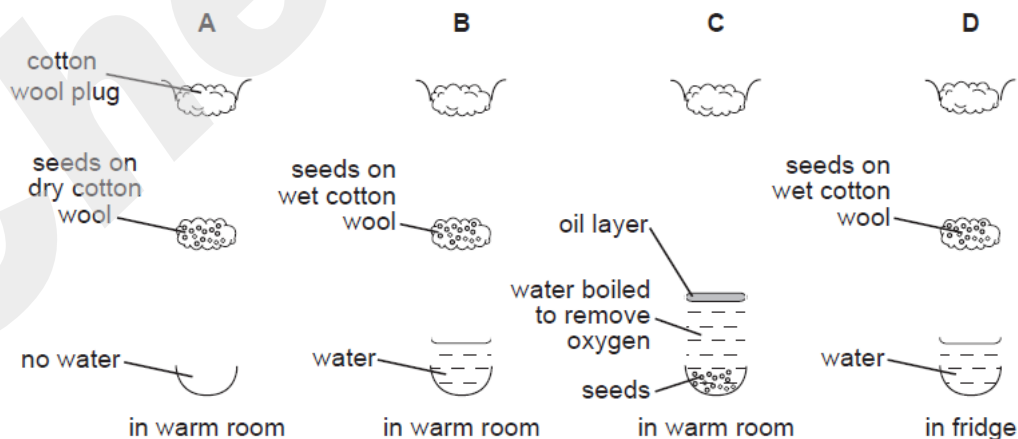
Which of the plants have the same phenotype?

- A 1, 2 and 4 only
- B 1, 2, 3 and 4
- C 3 and 5 only
- D 3, 4 and 5

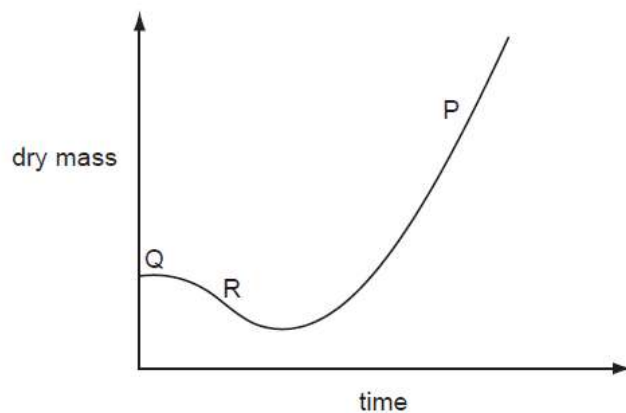
Oct/Nov 2006

27 Four test-tubes were set up as shown in the diagram and left for one week.

In which test-tube would the seeds germinate fastest and grow the most?



28 The graph shows how dry mass of a plant changes with time.



The letters represent three stages in the life cycle of a plant.

Which letter represents each stage?

	green leaves developing	seed	seed germinating
A	P	Q	R
B	Q	R	P
C	R	P	Q
D	Q	P	R

29 Which is a sudden change in a gene or chromosome?

- A allele
- B genotype
- C mutation
- D phenotype

- 30** A gene for the colour of hair in mice has two alleles. B represents the allele for grey hair, and b represents the allele for white hair.

A mouse with grey hair breeds with a mouse with white hair producing four offspring, with genotypes Bb, Bb, bb and bb.

What are the genotypes of the parents?

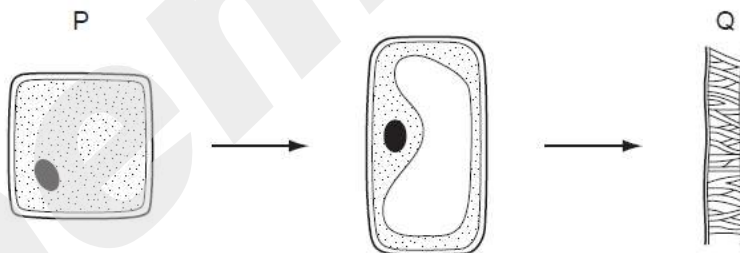
- A** both heterozygous
 - B** both homozygous dominant
 - C** one heterozygous and one homozygous dominant
 - D** one heterozygous and one homozygous recessive
- 31** A heterozygous tall pea plant, Tt, is self-fertilised.

What are the offspring most likely to be?

- A** all tall plants
- B** all plants of medium height
- C** one tall plant to three short plants
- D** three tall plants to one short plant

May/June 2007

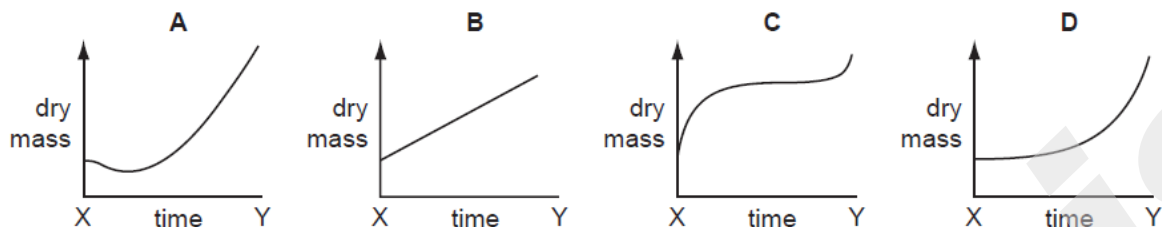
- 28** The diagrams show a plant cell P changing to become cell Q.



What do the changes between P and Q show?

- A** development and germination
- B** germination and mitosis
- C** growth and development
- D** mitosis and growth

29 Which graph shows the change in dry mass from the time a seed starts to germinate (X) until green leaves have appeared above the soil (Y)?



30 Which feature of a human is controlled by genes only?

- A age at death
- B blood group
- C dietary deficiency disease
- D lung cancer

31 A dominant allele

- A causes only harmful characteristics.
- B is responsible for male characteristics.
- C never undergoes mutation.
- D produces the same phenotype in heterozygotes and homozygotes.

32 In one type of plant, the allele for red flowers (R) is dominant to the allele for white flowers (r).

A plant with red flowers is crossed with a plant with white flowers. Half of the offspring have red flowers and half have white flowers.

What are the genotypes of the parent plants?

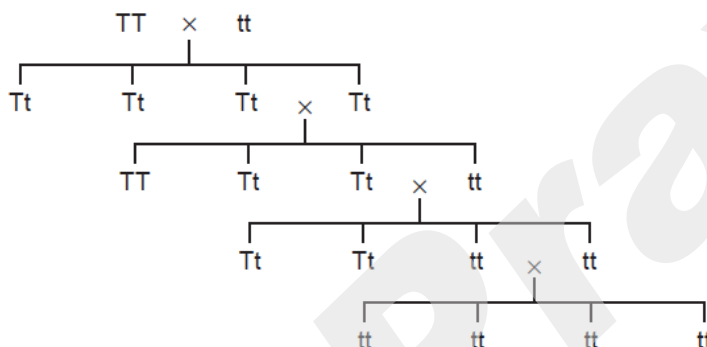
- A R and r
- B RR and rr
- C Rr and Rr
- D Rr and rr

Oct/Nov 2007

30 What causes humans to have different blood groups?

- A differences in climates
- B differences in diets
- C differences in genes
- D differences in hormones

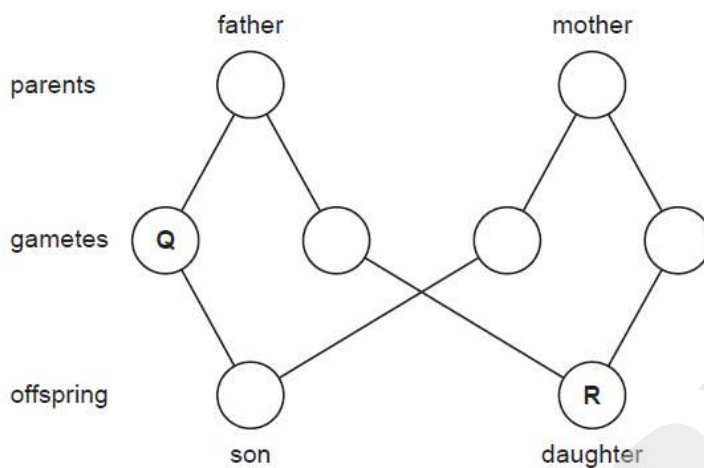
31 The genetic diagram shows a breeding experiment that starts with crossing a homozygous tall plant (TT) with a homozygous short plant (tt).



Which genetic cross gives 1:1 phenotypic and genotypic ratios?

- A $Tt \times Tt$ B $TT \times tt$ C $Tt \times tt$ D $tt \times tt$

32 The diagram shows the fusion of gametes to produce a son and a daughter.



What are the sex chromosomes in gamete **Q** and daughter **R**?

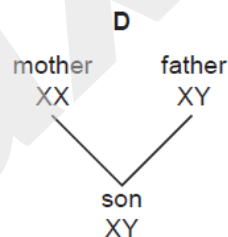
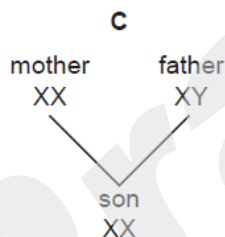
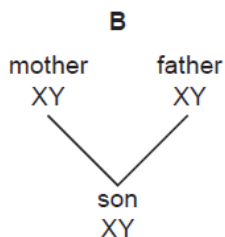
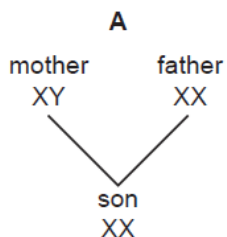
	Q	R
A	X	XX
B	X	XY
C	Y	XX
D	Y	XY

May/June 2008

30 In the life cycle of a mammal, what describes the eggs or sperms and the cells of the embryo?

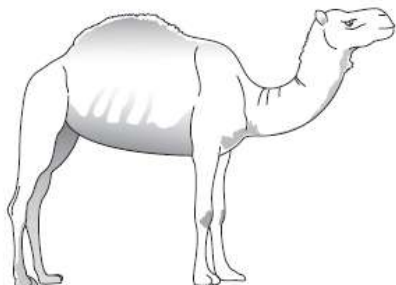
	eggs or sperms	cells of the embryo
A	diploid	diploid
B	diploid	haploid
C	haploid	diploid
D	haploid	haploid

31 Which cross shows how a boy inherits sex chromosomes from his parents?

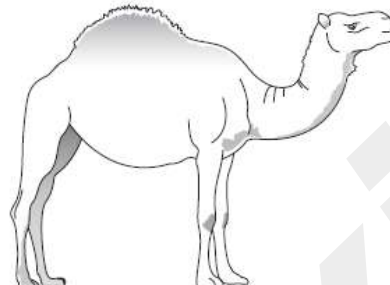


Oct/Nov 2008

29 The diagrams show a camel before and after drinking a large volume of water.



before

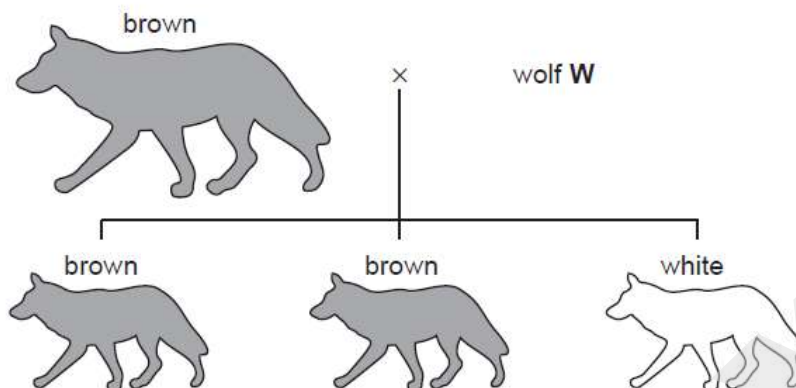


after

Which statement is correct?

- A Growth has occurred because the animal has increased in volume.
 - B Growth has occurred because the animal has increased in mass.
 - C Growth has not occurred because the animal's height is unaltered.
 - D Growth has not occurred because the dry mass has not increased.
- 30 The nucleus in each cell in the stem of a plant contains 32 chromosomes.
- How many chromosomes are there in the nuclei of its pollen grains?
- A 8 B 16 C 32 D 64

31 The diagram shows the offspring of a cross between two wolves.



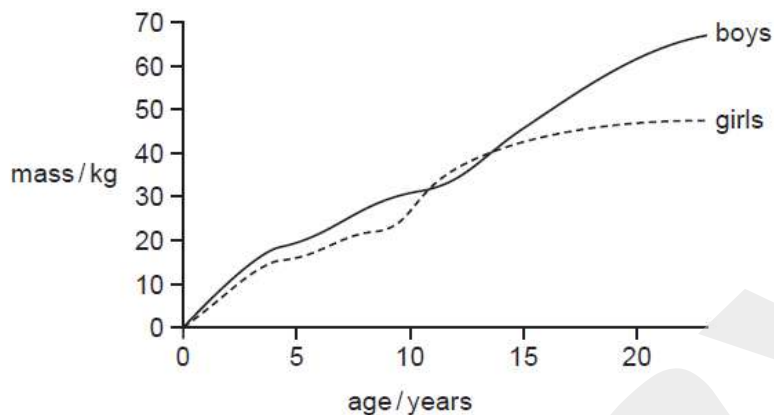
Brown colour is caused by a dominant allele B and white colour by a recessive allele b.

What are the genotype and the phenotype of wolf **W**?

	genotype	phenotype
A	B	brown
B	Bb	brown
C	brown	B
D	brown	Bb

May/June 2009

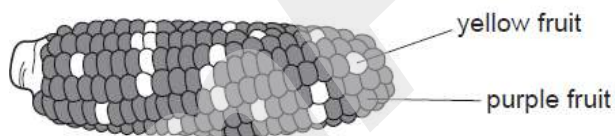
27 The graph shows the relationship between age and weight for boys and girls.



At what age does the graph show that girls are heavier than boys?

- A** 3 **B** 7 **C** 12 **D** 15

29 The diagram shows a maize (corn) cob with purple and yellow fruits. Purple (P) is dominant to yellow (p).



What are the genotypes of the parent maize plants?

- A** PP × Pp **B** PP × pp **C** Pp × Pp **D** pp × Pp

30 What is true of the chromosomes present in the daughter nuclei after meiosis and after mitosis?

	meiosis	mitosis
A	identical	identical
B	identical	non-identical
C	non-identical	identical
D	non-identical	non-identical