

**OXFORD CAMBRIDGE AND RSA EXAMINATIONS
GCSE**

B682/02

**ENVIRONMENTAL AND
LAND-BASED SCIENCE**

**Plant Cultivation and Small
Animal Care (Higher Tier)**

MONDAY 20 JUNE 2016: Morning

**DURATION: 1 hour
plus your additional time allowance**

MODIFIED ENLARGED

Candidate forename		Candidate surname	
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Centre number						Candidate number				
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Candidates answer on the Question Paper.

OCR SUPPLIED MATERIALS:
None

OTHER MATERIALS REQUIRED:
Pencil
Ruler (cm/mm)
Calculator

READ INSTRUCTIONS OVERLEAF

INSTRUCTIONS TO CANDIDATES

Write your name, centre number and candidate number in the boxes on the first page. Please write clearly and in capital letters.

Use black ink. HB pencil may be used for graphs and diagrams only.

Answer ALL the questions.

Read each question carefully. Make sure you know what you have to do before starting your answer.

Write your answer to each question in the space provided. If additional space is required, you should use the lined page(s) at the end of this booklet. The question number(s) must be clearly shown.

INFORMATION FOR CANDIDATES

The quality of written communication is assessed in questions marked with a pencil ().

The number of marks is given in brackets [] at the end of each question or part question.

The total number of marks for this paper is 50.

Any blank pages are indicated.

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Answer ALL the questions.

1 A leaf of a tomato plant is infested with whitefly.

A gardener wishes to control the whitefly.

Discuss the ADVANTAGES and DISADVANTAGES of biological pest control compared to non-biological pest control.

[3]

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2 Students are preparing plots for planting potatoes.

The students added organic fertiliser to five plots and inorganic fertiliser to five plots.

They planted four seed potatoes in each plot.

After two months, they harvested the potatoes and weighed them.

The results are shown in the table below.

GROWING SYSTEM	POTATO YIELD (kg)					
	Plot 1	Plot 2	Plot 3	Plot 4	Plot 5	Mean
Organic	1.43	4.06	2.98	1.46	4.58	
Inorganic	1.46	0.14	0.00	0.44	0.60	0.53

(a) Calculate the mean (average) yield of potatoes in the organic plots.

Show your working

_____ kg [2]

(b) One of the students concluded that:

‘Using organic fertilisers always produces a higher yield of potatoes.’

Do you agree with this conclusion? Explain your answer using data from the table.

[2]

- (c) Well-rotted manure, coarse sand and lime are often added to soils to improve fertility and crumb structure.**

Explain the effect each of these have on soil structure and fertility.



The quality of written communication will be assessed in your answer to the question. [6]

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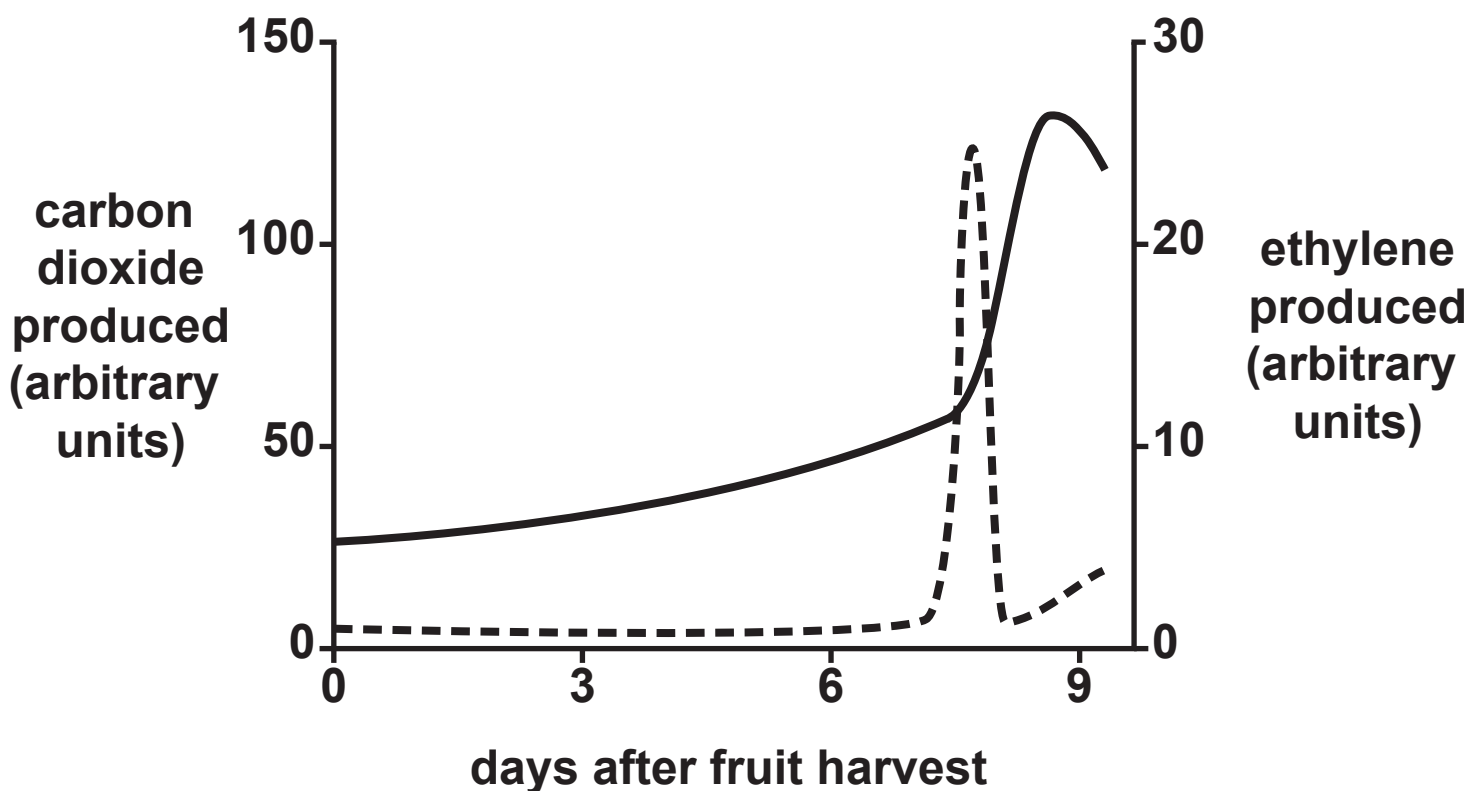
3 Gases are produced by fruit after harvesting.

The graph below shows the levels of two of the gases produced, carbon dioxide (CO₂) and ethylene.

key:

———— carbon dioxide

----- ethylene



Describe the changes in the gases and explain the reasons for these changes.

[4]

4 Pests and diseases can affect yield, quality and appearance of plants.

Using named examples, describe how pests and diseases can result in plant ill health AND explain how these can be controlled in plant cultivation.



The quality of written communication will be assessed in your answer to the question.

[6]

5 The diagram shows a plant reproducing asexually.



Describe how this plant reproduces asexually.

[2]

- 6 All modern chickens are originally descended from red jungle fowl.**

The photograph below shows two breeds of chicken.

The chicken on the left has been bred for meat production (broiler).

The chicken on the right has been bred for egg production (layer).



Sarah investigates the growth rate of two breeds of chicken.

She weighs one layer chicken and one broiler chicken on six occasions in the 30 days after hatching.

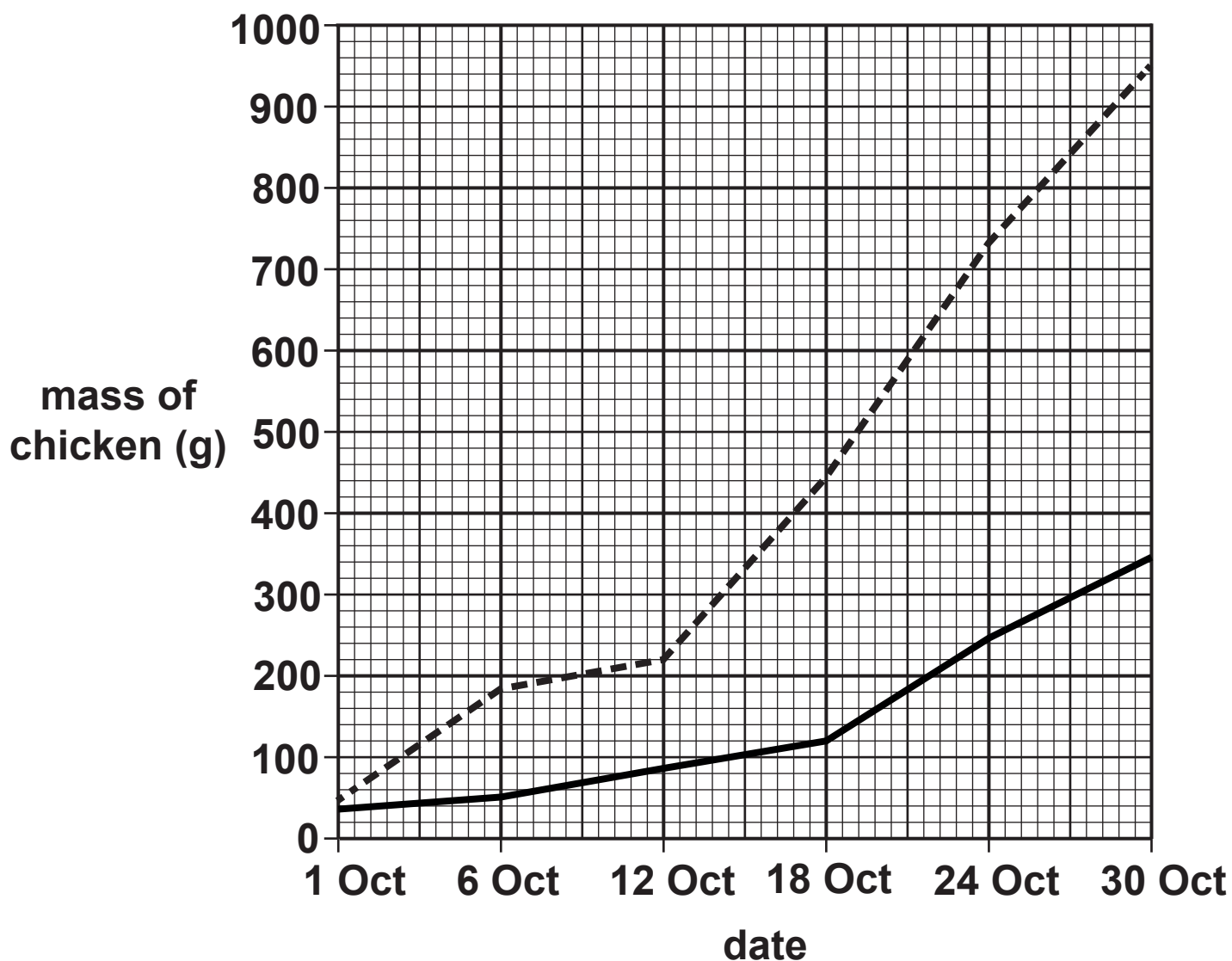
Sarah's results are shown in the table and the graph opposite.

DATE	MASS OF CHICKENS (g)	
	Layer	Broiler
1 October	39	48
6 October	51	181
12 October	82	220
18 October	120	443
24 October	244	730
30 October	342	950

key:

---- broiler

— layer



- (a) Compare the growth of the layer chicken and the broiler chicken.

Use information from the graph AND the table in your answer.

[3]

- (b) Sarah investigated the growth rate of chickens for 30 days after hatching.

$$\text{growth rate} = \frac{\text{increase in mass (g)}}{\text{number of days taken to increase in mass (days)}}$$

Calculate the growth rate for the broiler chicken.

Show your working.

_____ g per day [2]

(c) Suggest TWO ways in which Sarah could improve her investigation.

1 _____

2 _____

[2]

(d) Original red jungle fowl laid between 10 to 15 eggs a year.

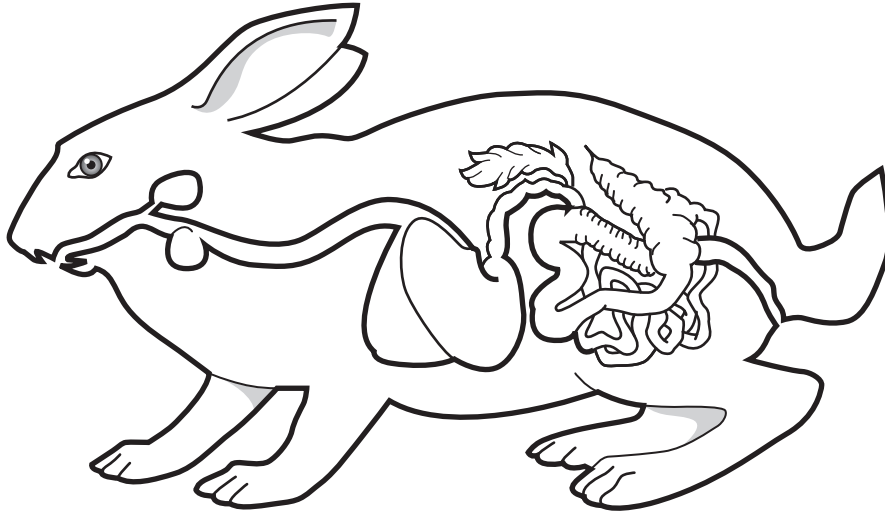
Modern varieties have been selectively bred to lay over 300 eggs a year.

Selective breeding can lead to health problems in poultry due to inbreeding.

Explain the dangers associated with inbreeding.

[3]

7 Animals need to digest their food to get nutrients.



Describe how a rabbit digests grass and absorbs the products. Include the functions of the organs of the digestive system in your answer.



The quality of written communication will be assessed in your answer to the question.

[6]

8 Laying hens are often kept in sheds.

The amount of light in the sheds is carefully controlled.

The graph opposite shows how many hours of light the hens get at different ages.

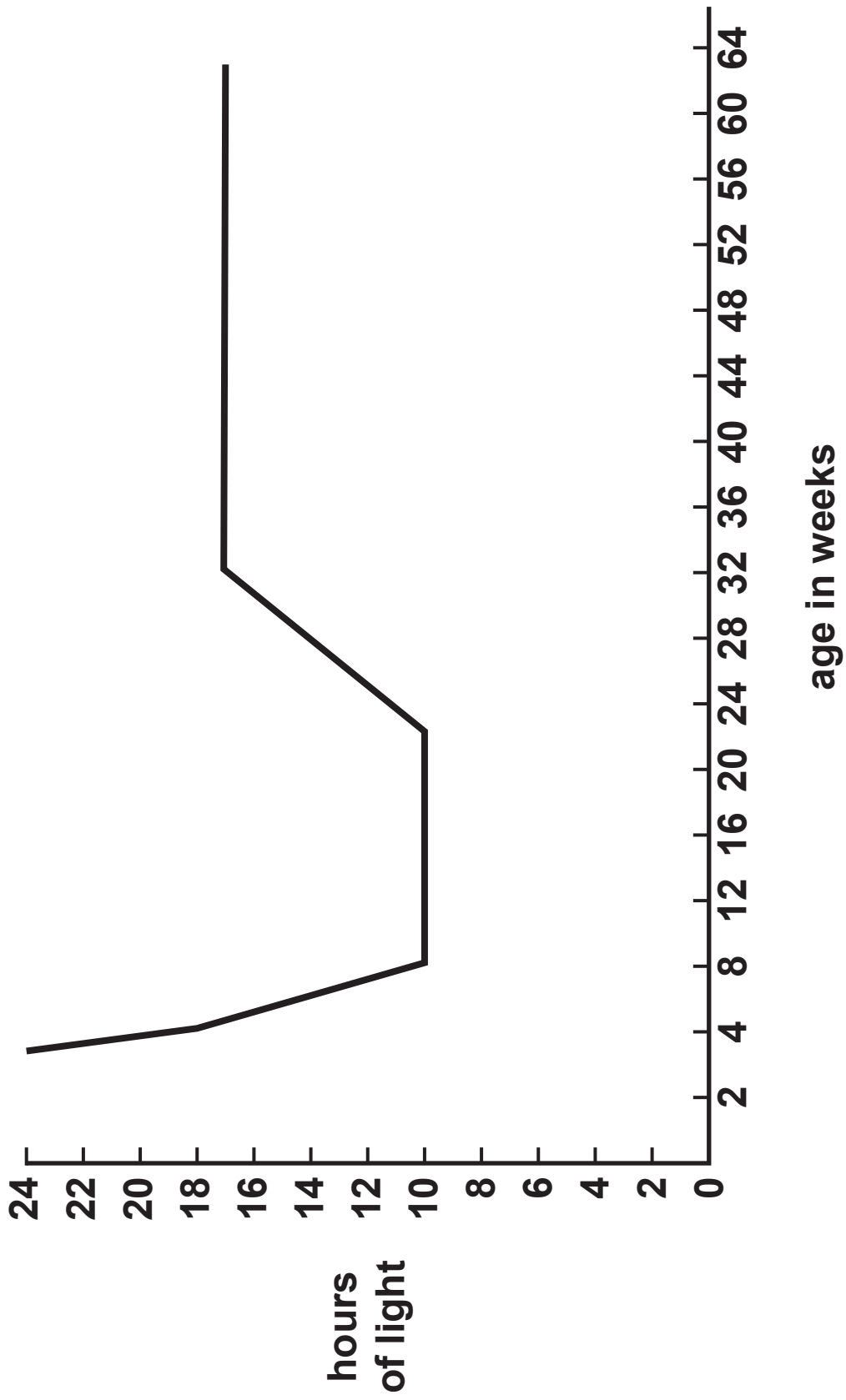
Hens start laying eggs when the days get longer.

(a) At what age will the hens start laying eggs?

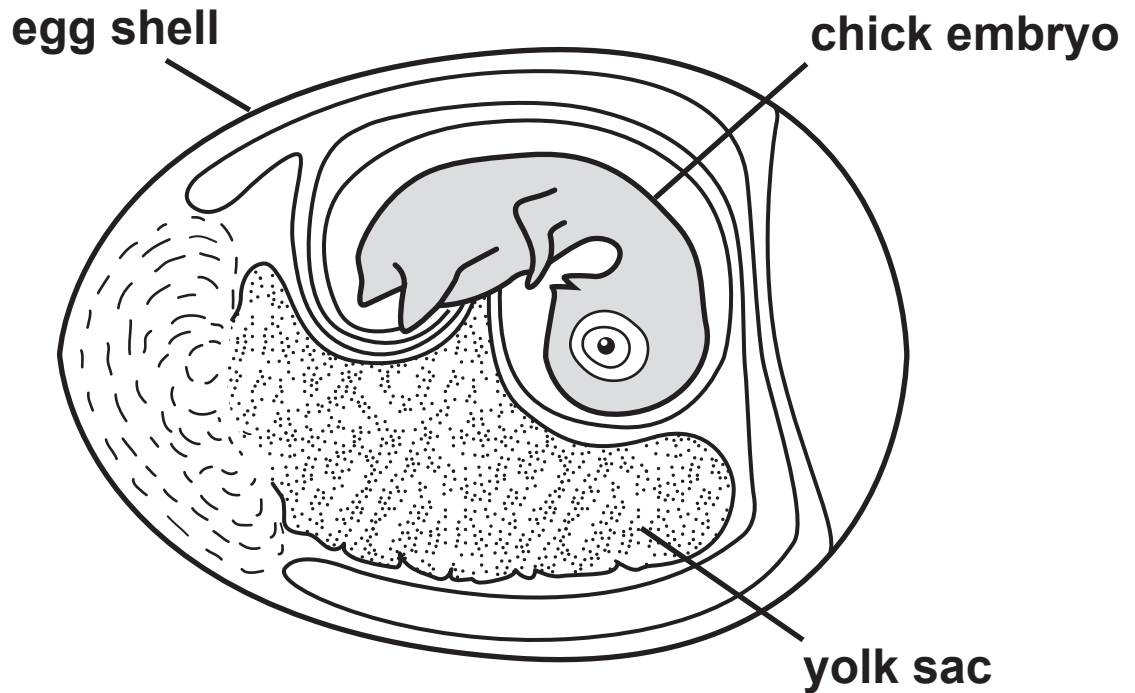
_____ **[1]**

(b) Suggest why birds have evolved in this way.

_____ **[2]**



(c) The diagram shows a developing chick embryo.



Eggs shells are porous.

What is the significance of a porous egg shell to the development of the embryo?

[2]

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9 Selma has a pet rabbit.

She decides to monitor its activity.

She observes the rabbit for one hour and produces a pie chart to show how long the rabbit spends on different activities.

One week later, she observes the rabbit again for one hour at the same time of day.

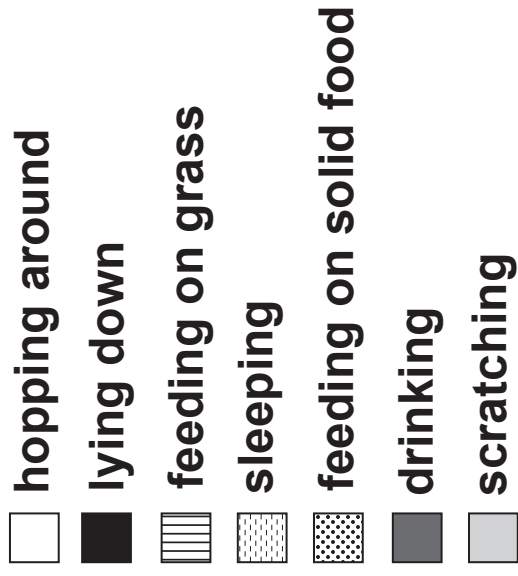
She produces a second pie chart to show these results.

After her second observation, Selma becomes worried that her rabbit has parasites.

Using the data opposite, describe and explain why.

[2]

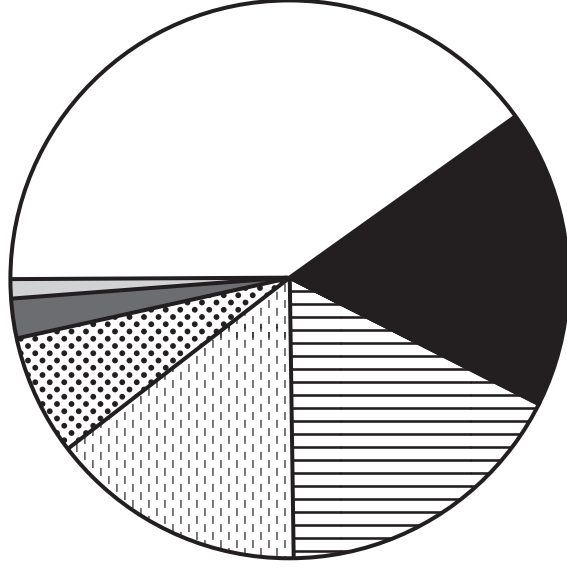
key:



25

FIRST OBSERVATION

Time spent on activity

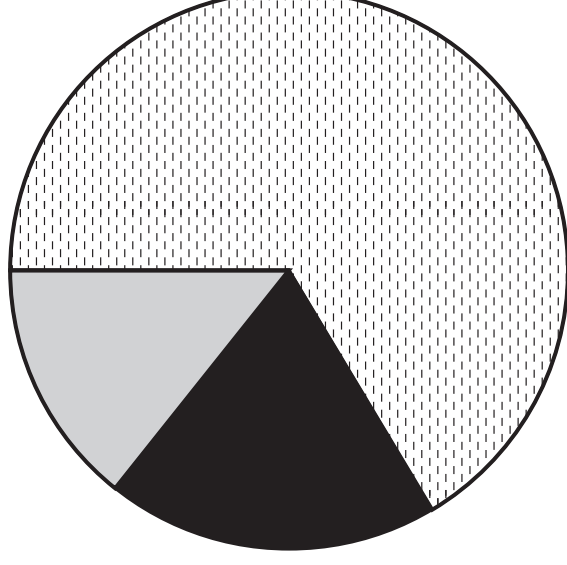


key:



SECOND OBSERVATION

Time spent on activity



10 Paul has a pet dog.

He is thinking about having it castrated.

Discuss the ethical issues for AND against castrating dogs.

[2]

END OF QUESTION PAPER

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ADDITIONAL ANSWER SPACE

If additional space is required, you should use the following lined page(s). The question number(s) must be clearly shown in the margin(s).

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