



ACHIEVE ACADEMY

GCSE Maths — Higher Tier

Growth & Decay · Practice Booklet

NAME: _____

CLASS: _____

DATE: _____

☐ Developing

☒ Secure

☐ Greater Depth

Answer every question in the working space provided. Method marks are available for correct working even if the final answer is wrong. Check the time allowed with your tutor before you start.

Growth & Decay

Total marks available: 134

● Growth & Decay

Q1

[4 marks]

The population of a town is 60,430 now. It grows by 2.5% each year. Find its value after 4 years, correct to the nearest whole number.

Q2

[4 marks]

The number of bacteria in a culture is 8,610 now. It grows by 7.5% each year. Find its value after 3 years, correct to the nearest whole number.

Q3

[4 marks]

The value of a car decreases by 9.5% each year. After 2 years it is £27,936.94. Find its original value, correct to the nearest penny.

Q4

[4 marks]

The value of a laptop decreases by 7.5% each year. After 2 years it is £393.59. Find its original value, correct to the nearest penny.

Q5

[4 marks]

The number of bacteria in a culture is 15,070 now. It grows by 3.5% each year. Find its value after 4 years, correct to the nearest whole number.

Q6

[4 marks]

The number of bacteria in a culture is 14,690 now. It grows by 4.5% each year. Find its value after 3 years, correct to the nearest whole number.

Q7

[4 marks]

The number of bacteria in a culture is 9,400 now. It grows by 5.5% each year. Find its value after 3 years, correct to the nearest whole number.

Q8

[4 marks]

The number of members of a gym is 3,520 now. It grows by 4.5% each year. Find its value after 4 years, correct to the nearest whole number.

Q9

[4 marks]

The value of a laptop decreases by 7.5% each year. After 3 years it is £2,105.27. Find its original value, correct to the nearest penny.

Q10

[4 marks]

The value of a car decreases by 11.5% each year. After 3 years it is £9,939.83. Find its original value, correct to the nearest penny.

Q11

[5 marks]

The value of a laptop is £1,940. It decreases by 9% per year for 3 years, then decreases by 8% per year for 2 more years. Find its final value, correct to the nearest penny.

Q12

[5 marks]

The number of fish in a lake is 1,190. It decreases by 8% per year for 3 years, then grows by 8% per year for 1 more year. Find its final value, correct to the nearest whole number.

Q13

[5 marks]

The value of a rare stamp collection was £2,150 and grew to £2,613.34 over 4 years, growing by the same percentage each year. Find the annual percentage growth rate, correct to 2 decimal places.

Q14

[5 marks]

The number of fish in a lake is 2,120. It grows by 4% per year for 2 years, then decreases by 9% per year for 3 more years. Find its final value, correct to the nearest whole number.

Q15

[5 marks]

The value of a car is £14,460. It decreases by 6% per year for 1 year, then decreases by 6% per year for 2 more years. Find its final value, correct to the nearest penny.

Q16

[5 marks]

The value of a rare stamp collection was £6,970 and grew to £10,724.21 over 5 years, growing by the same percentage each year. Find the annual percentage growth rate, correct to 2 decimal places.

Q17

[5 marks]

The value of a laptop is £1,220. It decreases by 8% per year for 2 years, then grows by 8% per year for 2 more years. Find its final value, correct to the nearest penny.

Q18

[5 marks]

The mass of a radioactive sample is 390 g. It grows by 6% per year for 3 years, then decreases by 4% per year for 1 more year. Find its final value, correct to the nearest whole number.

Q19

[5 marks]

The number of members of a gym was 1,980 and grew to 2,292 over 3 years, growing by the same percentage each year. Find the annual percentage growth rate, correct to 2 decimal places.

Q20

[5 marks]

The mass of a radioactive sample is 740 g. It decreases by 3% per year for 2 years, then decreases by 3% per year for 1 more year. Find its final value, correct to the nearest whole number.

Q21

[5 marks]

The mass of a radioactive sample was 710 g and fell to 554 g over 4 years, falling by the same percentage each year. Find the annual percentage decay rate, correct to 2 decimal places.

Q22

[5 marks]

The number of fish in a lake was 4,020 and fell to 2,411 over 4 years, falling by the same percentage each year. Find the annual percentage decay rate, correct to 2 decimal places.

Q23

[4 marks]

The value of a rare stamp collection is £2,690 now and grows by 8% each year. Find the smallest whole number of years after which it will first exceed £3,660.

Q24

[4 marks]

The value of a rare stamp collection is £4,440 now and grows by 8% each year. Find the smallest whole number of years after which it will first exceed £6,041.

Q25

[4 marks]

The population of a town is 28,950 now and grows by 6% each year. Find the smallest whole number of years after which it will first exceed 38,742.

Q26

[4 marks]

The population of a town is 58,980 now and grows by 12% each year. Find the smallest whole number of years after which it will first exceed 73,985.

Q27

[5 marks]

The value of a laptop was £1,990 and fell to £1,450.71 over 3 years, falling by the same percentage each year. Find the annual percentage decay rate, correct to 2 decimal places.

Q28

[4 marks]

The number of members of a gym is 580 now and grows by 12% each year. Find the smallest whole number of years after which it will first exceed 815.

Q29

[5 marks]

The mass of a radioactive sample was 490 g and fell to 334 g over 3 years, falling by the same percentage each year. Find the annual percentage decay rate, correct to 2 decimal places.

Q30

[4 marks]

The number of bacteria in a culture is 2,020 now and grows by 12% each year. Find the smallest whole number of years after which it will first exceed 2,534.