

GCSE Mathematics

H

Growth & Decay

Higher Tier | Grades 7-8

Total Marks	Time	Questions
56	56 min	20

Instructions:

- Do not use a calculator when you see: 
- Answer all questions in the spaces provided.
- Show all your working - marks are awarded for method as well as final answers.
- Cross through any work you do not want to be marked.
- Check your answers if you have time at the end.

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Edexcel-style questions

Q1

Grade 7

Edexcel style

A population of bacteria starts at 200 and grows by 8% every hour. Find the population after 5 hours, giving your answer to the nearest whole number.

Answer _____

teachably

[2 marks]

Q2

Grade 7

Edexcel style

A radioactive substance has a mass of 80 g and decays by 12% per year. Find its mass after 4 years, giving your answer correct to 1 decimal place.

Answer _____

teachably

[2 marks]

Q3

Grade 8

Edexcel style

A population grows from 500 to 605 over 2 years at a constant annual percentage growth rate. Find the annual growth rate.

Answer _____

teachably

[3 marks]

Q4

Grade 8

Edexcel style

A population of 1000 bacteria grows at a rate of 10% per hour. Find the number of complete hours until the population first exceeds 2000.

Answer

teachably

[3 marks]**Q5**

Grade 8

Edexcel style

Town A has a population of 8000 and grows by 5% per year. Town B has a population of 10 000 and decreases by 3% per year. Find which town has the larger population after 4 years, and by how much (to the nearest whole number).

Answer

teachably

[4 marks]

AQA-style questions**Q6**

Grade 7

AQA style

A colony of insects starts at 150 and grows by 6% per day. Find the population after 4 days, giving your answer to the nearest whole number.

Answer

teachably

[2 marks]**Q7**

Grade 7

AQA style

The population of an endangered species is 1000 and decreases by 10% per year. Find the population after 3 years.

Answer

teachably

[2 marks]**Q8**

Grade 8

AQA style

A population grows from 400 to 576 over 2 years at a constant annual percentage growth rate. Find the annual growth rate.

Answer

teachably

[3 marks]

Q9

Grade 8

AQA style

A population of 500 grows at a rate of 20% per year. Find the number of complete years until the population first exceeds 1000.

Answer _____

teachably

[3 marks]

Q10

Grade 8

AQA style

Town A has a population of 6000 and grows by 8% per year. Town B has a population of 7000 and decreases by 5% per year. Find which town has the larger population after 3 years, and by how much (to the nearest whole number).

Answer _____

teachably

[4 marks]

OCR-style questions**Q11**

Grade 7

OCR style

The number of subscribers to an online channel starts at 500 and grows by 15% per month. Find the number of subscribers after 3 months, giving your answer to the nearest whole number.

Answer _____

teachably

[2 marks]**Q12**

Grade 7

OCR style

A radioactive isotope has a mass of 60 g and decays by 25% per hour. Find its mass after 3 hours, giving your answer correct to 1 decimal place.

Answer _____

teachably

[2 marks]**Q13**

Grade 8

OCR style

A population grows from 300 to 507 over 2 years at a constant annual percentage growth rate. Find the annual growth rate.

Answer _____

teachably

[3 marks]

Q14

Grade 8

OCR style

A radioactive substance has a mass of 800 g and decays by 15% per year. Find the number of complete years until the mass first falls below 400 g.

Answer _____

teachably

[3 marks]**Q15**

Grade 8

OCR style

A population of bacteria starts at 400 and grows by 20% per hour for 2 hours, then decreases by 10% per hour for the next 2 hours. Find the population after 4 hours in total, to the nearest whole number.

Answer _____

teachably

[4 marks]

Teachably-style questions**Q16**

Grade 7

Teachably style

A tree's height is 80 cm and increases by 25% per year. Find its height after 3 years.

Answer

teachably

[2 marks]**Q17**

Grade 7

Teachably style

The area of a rainforest is 500 km² and decreases by 8% per year due to deforestation. Find the area after 5 years, giving your answer to the nearest whole number.

Answer

teachably

[2 marks]**Q18**

Grade 8

Teachably style

The mass of a radioactive substance decreases from 1000 g to 810 g over 2 years at a constant annual percentage decay rate. Find the annual decay rate.

Answer

teachably

[3 marks]

Q19

Grade 8

Teachably style

A population of 2000 decreases by 8% per year. Find the number of complete years until the population first falls below 1000.

Answer _____

teachably

[3 marks]

Q20

Grade 8

Teachably style

A radioactive sample has a mass of 200 g. It decays by 15% per year for 2 years, then a further treatment causes it to decay by 25% in the third year. Find the final mass after 3 years in total, correct to 1 decimal place.

Answer _____

teachably

[4 marks]

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