
GCSE Mathematics

Growth & Decay

Mark Scheme - Higher Tier | Grades 7-8

M = method mark, A = accuracy mark (dependent on the preceding M mark), B = independent mark.

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Edexcel-style questions

Q1 Grade 7 Edexcel style

Total: 2

Part	Mark scheme	Marks
(a)	200×1.08^5	M1
(a)	294 bacteria	A1

Q2 Grade 7 Edexcel style

Total: 2

Part	Mark scheme	Marks
(a)	80×0.88^4	M1
(a)	48.0 g	A1

Q3 Grade 8 Edexcel style

Total: 3

Part	Mark scheme	Marks
(a)	$605 \div 500 = 1.21$	M1
(a)	the square root of 1.21 is 1.1	M1
(a)	10%	A1

Q4 Grade 8 Edexcel style

Total: 3

Part	Mark scheme	Marks
(a)	$1000 \times 1.1^7 = 1948.72$ (too small)	M1
(a)	$1000 \times 1.1^8 = 2143.59$ (exceeds 2000)	M1
(a)	8 hours	A1

Q5 Grade 8 Edexcel style

Total: 4

Part	Mark scheme	Marks
(a)	Town A = $8000 \times 1.05^4 = 9724$	M1
(a)	Town B = $10000 \times 0.97^4 = 8853$	M1
(a)	$9724 - 8853$	M1
(a)	Town A is larger, by 871	A1

AQA-style questions

Q6 Grade 7 AQA style

Total: 2

Part	Mark scheme	Marks
(a)	150×1.06^4	M1
(a)	189 insects	A1

Q7 Grade 7 AQA style

Total: 2

Part	Mark scheme	Marks
(a)	1000×0.9^3	M1
(a)	729	A1

Q8 Grade 8 AQA style

Total: 3

Part	Mark scheme	Marks
(a)	$576 \div 400 = 1.44$	M1
(a)	the square root of 1.44 is 1.2	M1
(a)	20%	A1

Q9 Grade 8 AQA style

Total: 3

Part	Mark scheme	Marks
(a)	$500 \times 1.2^3 = 864.00$ (too small)	M1
(a)	$500 \times 1.2^4 = 1036.80$ (exceeds 1000)	M1
(a)	4 years	A1

Q10 Grade 8 AQA style

Total: 4

Part	Mark scheme	Marks
(a)	Town A = $6000 \times 1.08^3 = 7558$	M1
(a)	Town B = $7000 \times 0.95^3 = 6002$	M1
(a)	$7558 - 6002$	M1
(a)	Town A is larger, by 1556	A1

OCR-style questions

Q11 Grade 7 OCR style

Total: 2

Part	Mark scheme	Marks
(a)	500×1.15^3	M1
(a)	760 subscribers	A1

Q12 Grade 7 OCR style

Total: 2

Part	Mark scheme	Marks
(a)	60×0.75^3	M1
(a)	25.3 g	A1

Q13 Grade 8 OCR style

Total: 3

Part	Mark scheme	Marks
(a)	$507 \div 300 = 1.69$	M1
(a)	the square root of 1.69 is 1.3	M1
(a)	30%	A1

Q14 Grade 8 OCR style

Total: 3

Part	Mark scheme	Marks
(a)	$800 \times 0.85^4 = 417.60$ (too large)	M1
(a)	$800 \times 0.85^5 = 354.96$ (below 400)	M1
(a)	5 years	A1

Q15 Grade 8 OCR style

Total: 4

Part	Mark scheme	Marks
(a)	growth multiplier over 2 hours = $1.2^2 = 1.44$	M1
(a)	decay multiplier over 2 hours = $0.9^2 = 0.81$	M1
(a)	population = $400 \times 1.44 \times 0.81$	M1
(a)	467	A1

Teachably-style questions

Q16 Grade 7 Teachably style

Total: 2

Part	Mark scheme	Marks
(a)	80×1.25^3	M1
(a)	156.25 cm	A1

Q17 Grade 7 Teachably style

Total: 2

Part	Mark scheme	Marks
(a)	500×0.92^5	M1
(a)	330 km ²	A1

Q18 Grade 8 Teachably style

Total: 3

Part	Mark scheme	Marks
(a)	$810 \div 1000 = 0.81$	M1
(a)	the square root of 0.81 is 0.9	M1
(a)	10% decay	A1

Q19 Grade 8 Teachably style

Total: 3

Part	Mark scheme	Marks
(a)	$2000 \times 0.92^8 = 1026.44$ (too large)	M1
(a)	$2000 \times 0.92^9 = 944.32$ (below 1000)	M1
(a)	9 years	A1

Q20 Grade 8 Teachably style

Total: 4

Part	Mark scheme	Marks
(a)	decay multiplier over first 2 years = $0.85^2 = 0.7225$	M1
(a)	decay multiplier for the third year = 0.75	M1
(a)	mass = $200 \times 0.7225 \times 0.75$	M1
(a)	108.4 g	A1

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