
GCSE Mathematics

Area Under a Graph & Rate of Change

Mark Scheme - Higher Tier | Grades 8-9

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

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Edexcel-style questions

Q1 Grade 8 Edexcel style

Total: 2

Part	Mark scheme	Marks
(a)	$(\frac{2}{2}) \times [(0 + 2) + 2(3 + 5 + 4)]$	M1
(a)	26 m	A1

Q2 Grade 8 Edexcel style

Total: 2

Part	Mark scheme	Marks
(a)	$\frac{12 - 0}{4 - 1}$	M1
(a)	4	A1

Q3 Grade 8 Edexcel style

Total: 2

Part	Mark scheme	Marks
(a)	area = speed $\times$ time	M1
(a)	the total distance travelled, in metres (m)	A1

Q4 Grade 9 Edexcel style

Total: 2

Part	Mark scheme	Marks
(a)	gradient = rate of change of volume with time	M1
(a)	the rate at which the tank is being filled, in litres per minute	A1

Q5 Grade 9 Edexcel style

Total: 2

Part	Mark scheme	Marks
(a)	compares the two gradient values	M1
(a)	increasing, because the gradient has become larger ($7 > 2$)	A1

AQA-style questions**Q6** Grade 8 AQA style**Total: 2**

Part	Mark scheme	Marks
(a)	$(\frac{3}{2}) \times [(2 + 2) + 2(6 + 8 + 6)]$	M1
(a)	66 km	A1

Q7 Grade 8 AQA style**Total: 2**

Part	Mark scheme	Marks
(a)	$\frac{-3 - 5}{1 - (-3)}$	M1
(a)	-2	A1

Q8 Grade 8 AQA style**Total: 2**

Part	Mark scheme	Marks
(a)	area = speed $\times$ time	M1
(a)	the total distance travelled, in kilometres (km)	A1

Q9 Grade 9 AQA style**Total: 2**

Part	Mark scheme	Marks
(a)	gradient = rate of change of velocity with time	M1
(a)	the acceleration of the car, in metres per second squared (m/s^2)	A1

Q10 Grade 9 AQA style**Total: 2**

Part	Mark scheme	Marks
(a)	compares the two gradient values	M1
(a)	decreasing, because the gradient has become smaller ($1 < 5$)	A1

OCR-style questions**Q11** Grade 8 OCR style**Total: 2**

Part	Mark scheme	Marks
(a)	$(\frac{4}{2}) \times [(0 + 0) + 2(5 + 8 + 5)]$	M1
(a)	72 miles	A1

Q12 Grade 8 OCR style**Total: 2**

Part	Mark scheme	Marks
(a)	$\frac{15 - (-3)}{4 - 1}$	M1
(a)	6	A1

Q13 Grade 8 OCR style**Total: 2**

Part	Mark scheme	Marks
(a)	area = speed $\times$ time	M1
(a)	the total distance travelled, in miles	A1

Q14 Grade 9 OCR style**Total: 2**

Part	Mark scheme	Marks
(a)	gradient = rate of change of temperature with time	M1
(a)	the rate at which the temperature is falling, in degrees Celsius per minute	A1

Q15 Grade 9 OCR style**Total: 2**

Part	Mark scheme	Marks
(a)	compares the two gradient values	M1
(a)	increasing, because the gradient has become larger ($9 > 4$)	A1

Teachably-style questions

Q16 Grade 8 Teachably style

Total: 2

Part	Mark scheme	Marks
(a)	$(\frac{1}{2}) \times [(1 + 1) + 2(3 + 4 + 3)]$	M1
(a)	11 litres	A1

Q17 Grade 8 Teachably style

Total: 2

Part	Mark scheme	Marks
(a)	$\frac{-4 - 8}{0 - (-3)}$	M1
(a)	-4	A1

Q18 Grade 8 Teachably style

Total: 2

Part	Mark scheme	Marks
(a)	area = rate $\times$ time	M1
(a)	the total volume of water that has left the tank, in litres	A1

Q19 Grade 9 Teachably style

Total: 2

Part	Mark scheme	Marks
(a)	gradient = rate of change of distance with time	M1
(a)	the speed of the runner, in metres per second (m/s)	A1

Q20 Grade 9 Teachably style

Total: 2

Part	Mark scheme	Marks
(a)	compares the two gradient values	M1
(a)	decreasing, because the gradient has become smaller ($3 < 10$)	A1

END OF PAPER

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