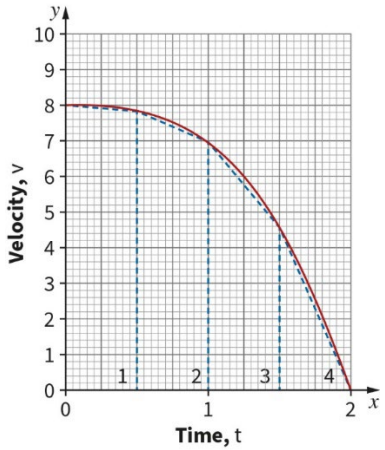
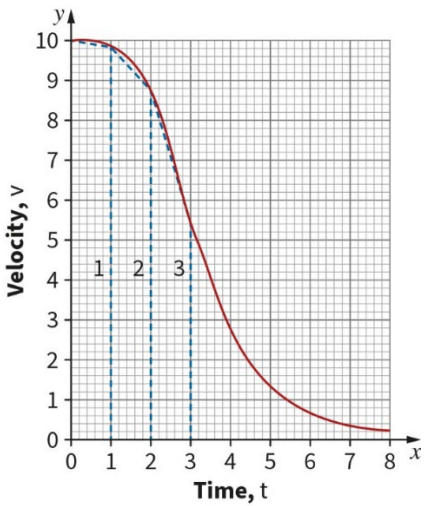
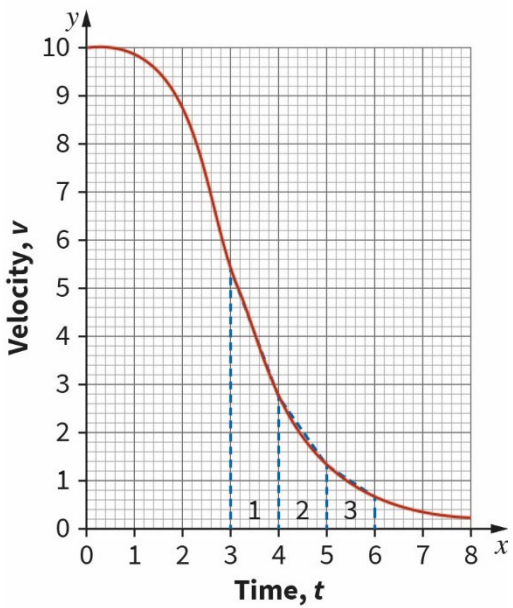
Oxford Revise | AQA GCSE Maths Higher | Answers

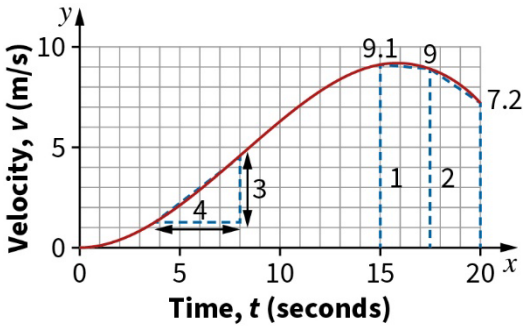
Chapter 14 Non-linear real-life graphs

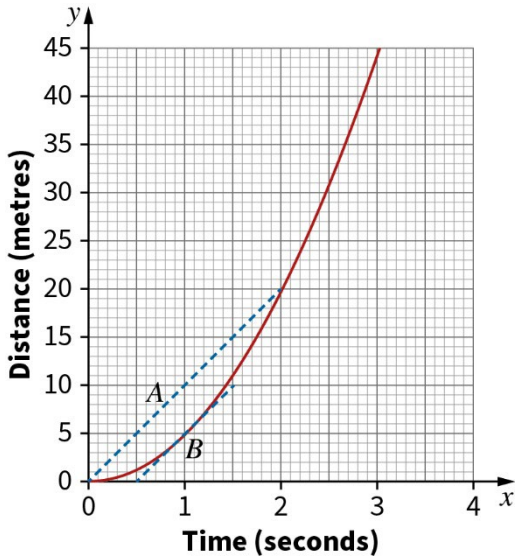
Question	Answer	Extra information	Marks
14.1 (a)	 Area of trapezium $1 = \frac{1}{2}(8+7.9)\times 0.5 = 3.975$ Area of trapezium $2 = \frac{1}{2}(7.9+7)\times 0.5 = 3.725$ Area of trapezium $3 = \frac{1}{2}(7+4.6)\times 0.5 = 2.9$ Area of trapezium $4 = \frac{1}{2}(4.6+0)\times 0.5 = 1.15$ Total area $= 3.975 + 3.725 + 2.9 + 1.15 = 11.75$	Finding the correct area for one trapezium Finding the correct area for the four trapeziums Correct answer	1 1 1

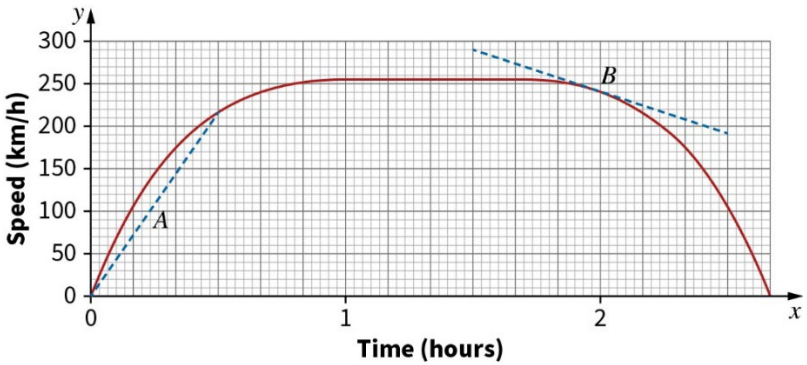
ISBN 9781382039833

Question	Answer	Extra information	Marks
14.1 (b)	The area under the curve represents the distance travelled by the particle in metres.	Correct answer, mentioning distance	1
14.1 (c)	The trapeziums all sit under the curve, and therefore underestimate the area.	Correct explanation	1
14.2 (a)	 Area of trapezium $1 = \frac{1}{2}(10+9.9)\times 1 = 9.95$ Area of trapezium $2 = \frac{1}{2}(9.9+8.6)\times 1 = 9.25$ Area of trapezium $3 = \frac{1}{2}(8.6+5.5)\times 1 = 7.05$ Total area (total distance) $= 26.25$ m	Finding the correct area for one trapezium Finding the correct area for the three trapeziums Correct answer	1 1 1

Question	Answer	Extra information	Marks
14.2 (b) (i)	 Area of trapezium $1 = \frac{1}{2}(5.5+2.8)\times 1 = 4.15$ Area of trapezium $2 = \frac{1}{2}(2.8+1.4)\times 1 = 2.1$ Area of trapezium $3 = \frac{1}{2}(1.4+0.7)\times 1 = 1.05$ Total area (total distance) = 7.3 m	Finding the correct area for one trapezium Finding the correct area for the three trapeziums Correct answer	1 1 1

Question	Answer	Extra information	Marks
14.2 (b) (ii)	This is an overestimate because the trapeziums lie slightly above the curve	overestimate, with reason	1
14.3 (a)	 Acceleration = gradient of the tangent at a point When $t = 5$, gradient $= \frac{3}{4} = 0.75$ The acceleration at $t = 5$ is 0.75 m/s^2	Drawing a line with the correct slope at the point on the curve where $t = 5$ Attempt to find gradient here Answer between 0.7 and 0.8	1 1 1
14.3 (b) (i)	Width of each strip $= 2.5$ Area of trapezium $1 = \frac{1}{2}(9.1 + 9.0) \times 2.5 = 22.625$ Area of trapezium $2 = \frac{1}{2}(9.0 + 7.2) \times 2.5 = 20.25$ Total area $= 43$	Using strips of width 2.5 Using correct formula for the area of either trapezium Finding the area of each trapezium Correct answer	1 1 1 1
14.3 (b) (ii)	It represents the distance travelled, in metres, between 15 and 20 seconds.	"Distance" mentioned	1

Question	Answer	Extra information	Marks
14.4 (a)	Weeks 3, 5, 7 and 9		3
14.4 (b)	9 and 12	The slope is the least steep here	1
14.4 (c)	2 cm growth in 2 weeks means 1 cm per week		1
14.5	Left to right in table: B, A, C	One correct All correct	1 1
14.6 (a)	 Average speed = gradient of the chord = $\frac{20-0}{2-0} = 10$ m/s	Chord drawn, or an attempt to find the gradient of the chord Correct answer	1 1

Question	Answer	Extra information	Marks
14.6 (b)	Speed = gradient of the tangent $\approx \frac{10-0}{1.5-0.5} = 10$ m/s	Tangent drawn Method to find the gradient of the tangent Answer between 9.5 and 10.5	1 1 1
14.7 (a)	 Average acceleration = gradient of chord = $\frac{215-0}{0.5-0} = 430$ km/h^2	Chord drawn, or an attempt at the gradient Correct answer	1 1
14.7 (b)	The train starts to slow down (decelerate)		1
14.7 (c)	Acceleration = gradient of tangent $\approx \frac{190-290}{2.5-1.5} = -100$ This means the train is decelerating at 100 km/h^2	Tangent drawn Method to find the gradient of the tangent Answer between 95 and 105	1 1 1

Question	Answer	Extra information	Marks
14.8	All exponential graphs of the form $y = k^x$, where k is a positive constant, pass through the point with coordinates **(0, 1)**. When $k > 1$, the graph will demonstrate exponential **growth**, and when $k < 1$ it demonstrates exponential **decay**.	1 mark for each	3
14.9	$(9, 14)$		1