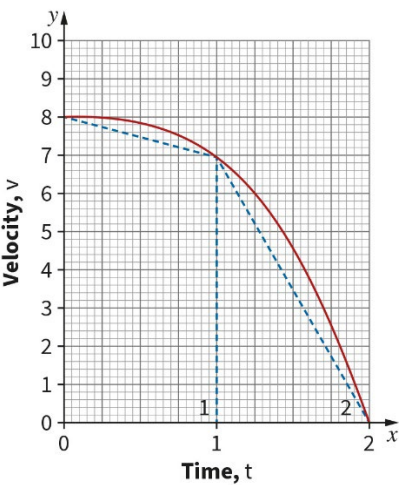
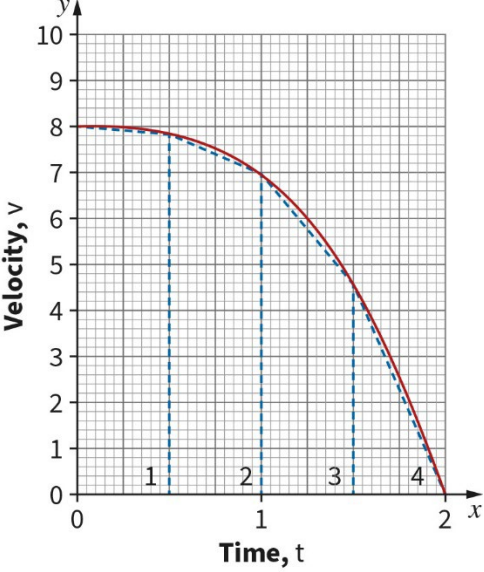


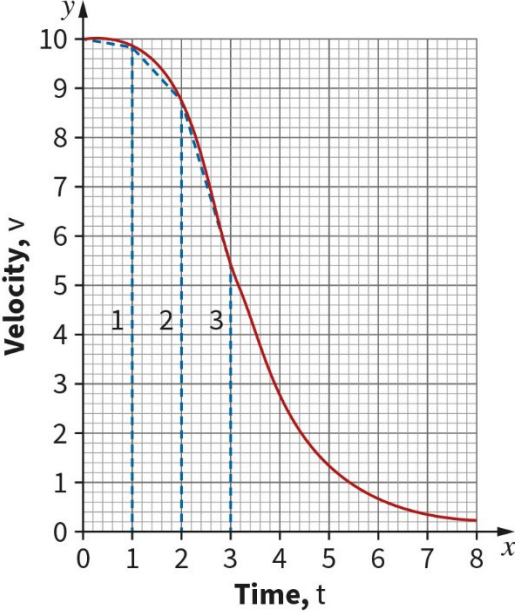
Oxford Revise | Edexcel GCSE Maths Higher | Answers

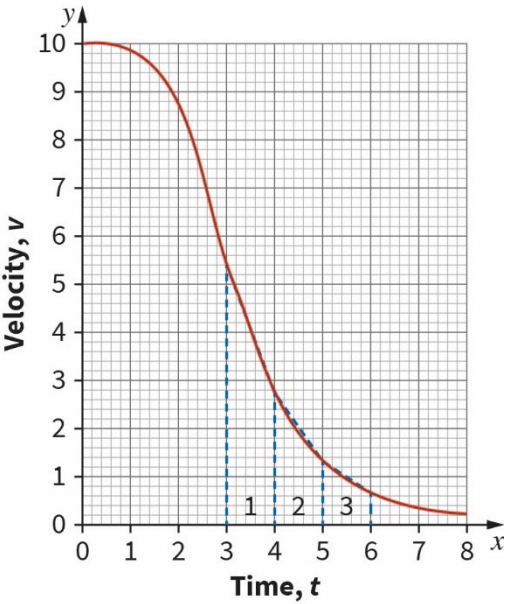
Chapter 14 Non-linear real-life graphs

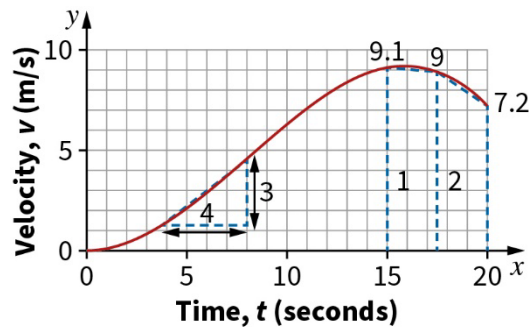
Question	Answer	Extra information	Marks
14.1 (a)	 <p>Area of trapezium 1 = $\frac{1}{2}(8+7) \times 1 = 7.5$ Area of trapezium 2 = $\frac{1}{2}(7+0) \times 1 = 3.5$ Total area = $7.5 + 3.5 = 11$</p>	<p>Finding the correct area for one trapezium Finding the correct area for two trapeziums Correct answer</p>	<p>1 1 1</p>

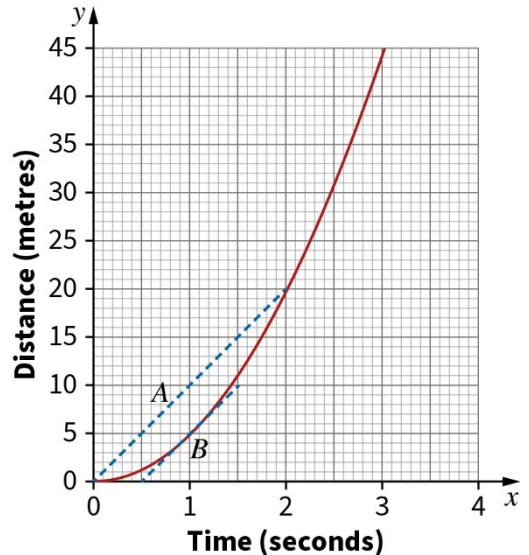
Question	Answer	Extra information	Marks
14.1 (b)	 <p>Area of trapezium 1 = $\frac{1}{2}(8 + 7.9) \times 0.5 = 3.975$</p> <p>Area of trapezium 2 = $\frac{1}{2}(7.9 + 7) \times 0.5 = 3.725$</p> <p>Area of trapezium 3 = $\frac{1}{2}(7 + 4.6) \times 0.5 = 2.9$</p> <p>Area of trapezium 4 = $\frac{1}{2}(4.6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

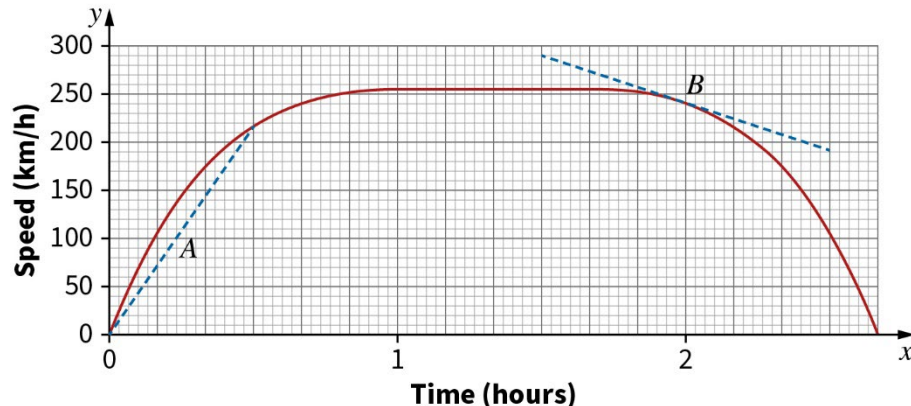
Question	Answer	Extra information	Marks
14.1 (c)	The trapeziums used for parts (a) and (b) all sit under the curve, and therefore underestimate the area. Splitting the area into 4 sections rather than 2 produces a closer approximation, therefore is less of an underestimate/gives a larger answer.	Correct explanation	1
14.1 (d)	The area under the curve represents the distance travelled by the particle in metres.	Correct answer, mentioning distance	1

Question	Answer	Extra information	Marks
14.2 (a)	 <p>Area of trapezium 1 = $\frac{1}{2}(10 + 9.9) \times 1 = 9.95$</p> <p>Area of trapezium 2 = $\frac{1}{2}(9.9 + 8.6) \times 1 = 9.25$</p> <p>Area of trapezium 3 = $\frac{1}{2}(8.6 + 5.5) \times 1 = 7.05$</p> <p>Total area (total distance) = 26.25 m</p>	<p>Finding the correct area for one trapezium</p> <p>Finding the correct area for the three trapeziums</p> <p>Correct answer</p>	<p>1</p> <p>1</p> <p>1</p>

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

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)	 <p>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</p>	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)	 <p>Average speed = gradient of the chord = $\frac{20-0}{2-0} = 10 \text{ m/s}$</p>	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 $\approx \frac{10-0}{1.5-0.5} = 10 \text{ m/s}$	Tangent drawn Method to find the gradient of the tangent Answer between 9.5 and 10.5	1 1 1
14.7 (a)	 <p>Average acceleration = gradient of chord = $\frac{215-0}{0.5-0} = 430 \text{ km/h}^2$</p>	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)	<p>Acceleration = gradient of tangent $\approx \frac{190-290}{2.5-1.5} = -100$</p> <p>This means the train is decelerating at 100 km/h^2</p>	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