## **Topic: Area Under Graph and Gradient of Curve**



Topic/Skill	Definition/Tips	Example
1. Area Under a Curve	To find the area under a curve, <b>split it up into simpler shapes</b> – such as rectangles, triangles and trapeziums – that approximate the area.	50 40 40 40 30 10 0 1 2 3 4 5 6 7 Time (hours)
2. Tangent to a Curve	A straight line that touches a curve at exactly one point.	Tangent line
3. Gradient of a Curve	The <b>gradient of a curve</b> at a point is the same as the <b>gradient of the tangent</b> at that point.  1. Draw a tangent carefully at the point. 2. Make a right-angled triangle. 3. Use the measurements on the axes to calculate the rise and run (change in y and change in x) 4. Calculate the gradient.	Gradient = $\frac{Change in y}{Change in x}$ $= \frac{16}{2} = 8$

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4. Rate of	The rate of change at a particular instant in	70
Change	time is represented by the <b>gradient of the</b>	60
8-	tangent to the curve at that point.	50 <u>E</u> 40
	the grant of the first the	ф 30
		20
		of change
		0 2 4 6 8 Time (s)
		70
		Negative rate
		© 40 of change
		(E) 40 of change
		20
		10
		0 2 4 6 8 Time (s)
5 D: 4	37 C 1.11 1.C 1	
5. Distance-	You can find the <b>speed</b> from the <b>gradient</b>	Distance
Time Graphs	of the line (Distance ÷ Time)	(Km) a
	The steeper the line, the quicker the speed.	2
	A horizontal line means the object is not	1
	moving (stationary).	0 0 1 2 3 4 5 5 7 8 9 10
C 77 1		Time (Hours)
6. Velocity-	You can find the <b>acceleration</b> from the	"
Time Graphs	<b>gradient</b> of the line (Change in Velocity ÷ Time)	Velocity (m/s)
	The steeper the line, the quicker the	
	acceleration.	
	A horizontal line represents no	Time (Seconds)
	acceleration, meaning a <b>constant velocity</b> .	Time (Seconds)
	The <b>area</b> under the graph is the <b>distance</b> .	

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