Question	Answer	Mark	Mark scheme	Additional guidance
12 (a)(i)	10	M1	for a tangent drawn at $t = 3$	A tangent must be seen to award any marks
		M1	for a complete method to find the gradient from tangent, eg $\frac{30}{3}$	This mark can be awarded if the tangent is drawn at $t \neq 3$
		A1	for answer in the range 8.5 to 11.5 or ft acceptable tangent at $t = 3$	Accept answers in the form $\frac{a}{b}$ where a and b are integers Award 0 marks for a correct answer (in the range) with no (or incorrect) supportive working
(ii)	Acceleration or rate of change of velocity	C1	for a correct explanation **Acceptable examples** acceleration rate of change of velocity increase in velocity each second how quickly the velocity increases increase in velocity over time the rate at which the particle is accelerating **Not acceptable examples** rate of change increase in velocity the velocity per second velocity ÷ time as time increases so does the velocity how steep the line is the acceleration of the particle and how far it got	Award if extra information is given provided not contradictory or incorrect Accept 'speed' for 'velocity'

Question	Answer	Mark	Mark scheme	Additional guidance
12 (b)	220	M1	for a method to find an appropriate area, eg $\frac{1}{2}\times 30\times 2\,(=30)$ oe or $\frac{1}{2}(30+50)\times(4-2)\,(=80)$ oe or $\frac{1}{2}\times(50+60)\times(6-4)\,(=110)$ oe **or** for a method to find an estimate for the area of at least one rectangle with height at intersection of midpoint and curve, eg 2 × 16 (= 32) oe or 2 × 42 (= 84) oe or 2 × 56 (= 112) oe	Must have one correct expression for the award of this mark May be seen as a rectangle added to a triangle
		M1	for a complete method, eg $\frac{1}{2}\times 30\times 2+\frac{1}{2}(30+50)\times 2+\frac{1}{2}(50+60)\times 2$ or $\frac{1}{2}\times 2\times(0+60+2(30+50))$ **or** 2 × 16 + 2 × 42 + 2 × 56	Allow 1 error in v values used
		A1	for 220 or 228	Allow 228 only if it comes from rectangle/midpoint method