



Q	Answer	Marks
1	a) 3 m/s^2 b) 576 m	3
2	a) 1.5 m/s^2 b) 168 m	3
3	147 m	3
4	a) 2.5 m/s^2 b) 680 m	4
5	a) 94.5 m b) underestimate, because the curve bends above the chords so each trapezium misses some area under the curve	4
6	a) 0.5 m/s^2 b) 84 m	4
7	a) 3 m/s^2 b) the acceleration is the gradient of the curve, and a tangent drawn by eye only approximates that gradient	4
8	a) 16 b) 1.6 m/s^2	4
9	a) 1.2 m/s^2 b) 1575 m	4
10	a) 1.5 m/s^2 b) 69 m c) underestimate, because the curve is concave and lies above the chords that form the tops of the trapezia	5
11	a) A 150 m, B 100 m b) 20 seconds	5
12	a) 98 m b) Amir has found the gradient of the chord from (0, 0) to (8, 11), which is the average acceleration over the first 8 seconds. The acceleration at $t = 8$ is the gradient of the tangent to the curve at $t = 8$, which is smaller here.	4
13	40 seconds	5
14	a) 1.7 m/s^2 (accept about 1.7 m/s^2) b) 23.8 m	5
15	a) 15 b) 1.25 m/s^2	6
16	a) 82.8 m b) 0.9 m/s^2 c) underestimate: the velocity increases at a decreasing rate, so the curve bows above each chord and the trapezia miss some area	7

Full worked solutions, written out by hand, are on the solutions sheet for this topic.