JRA Tutors
Private tuition and small online Study Pods

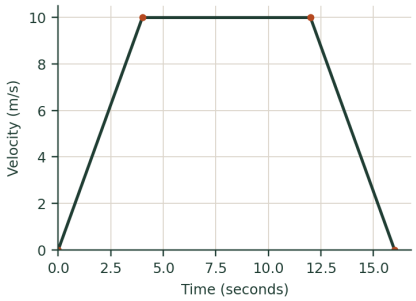
Velocity Time Graphs

Grade 8/9 topic · Higher tier · Edexcel and AQA

How to use this pack
20 questions that get harder as you go. Questions 1–15 (41 marks) build up to the harder Grade 8–9 style questions at the end; aim to complete all 20. Show your working on the lines and write your final answer on the answer line, then mark yourself with the answers at the back. Diagrams are not drawn accurately. Total: 65 marks.

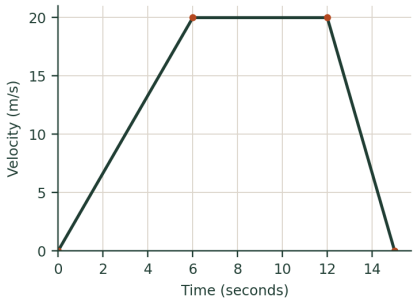
Warm-up

1 The velocity-time graph shows a car's journey. What is the maximum velocity? **[1 mark]**



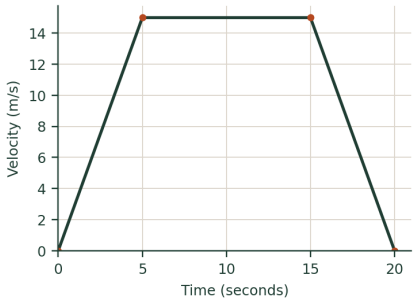
Answer _____

2 For how many seconds is the car travelling at a constant velocity? **[2 marks]**



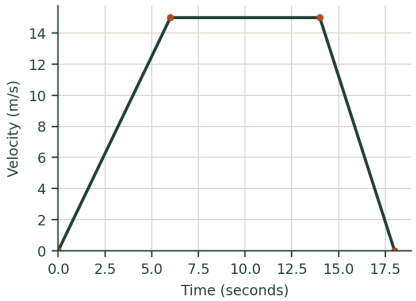
Answer _____

3 What is the total time of the journey? **[1 mark]**



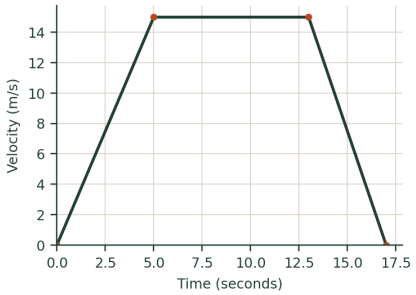
Answer _____

4 How long does the car take to reach its maximum velocity? **[2 marks]**



Answer _____

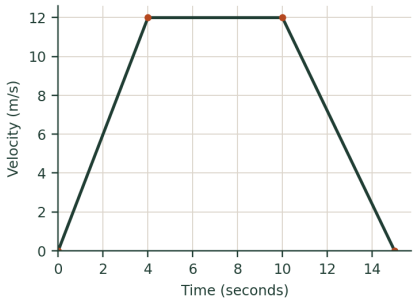
5 At what time does the car start to slow down? **[2 marks]**



Answer _____

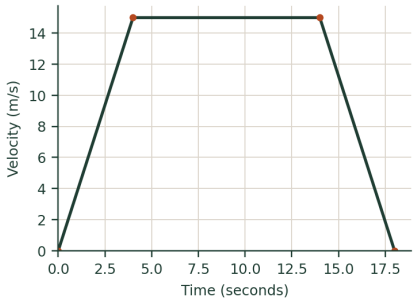
Core

6 Work out the acceleration of the car during the first part of the journey. **[3 marks]**



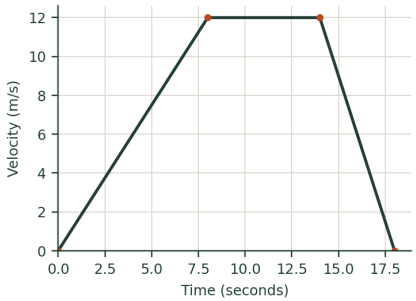
Answer _____

7 Work out the deceleration of the car in the last part of the journey. **[3 marks]**



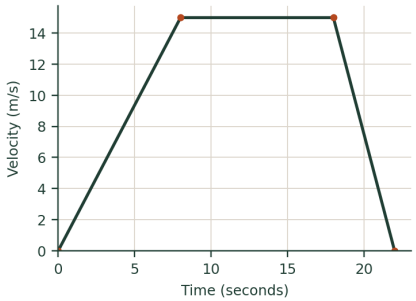
Answer _____

8 Work out the distance travelled while accelerating. **[3 marks]**



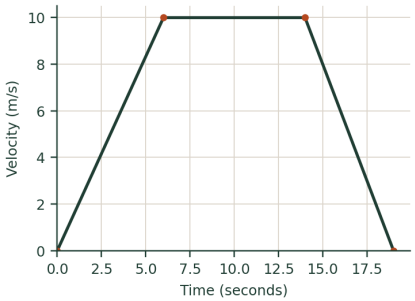
Answer _____

9 Work out the distance travelled at constant velocity. **[3 marks]**



Answer _____

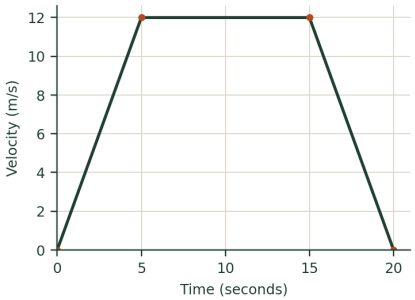
10 Work out the distance travelled while slowing down. **[3 marks]**



Answer _____

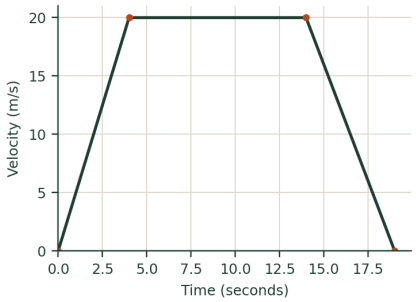
Stretch

11 Work out the total distance travelled. **[5 marks]**



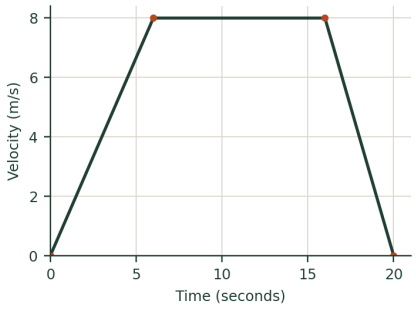
Answer _____

12 Work out the average speed for the whole journey. Give your answer to 3 s.f. **[5 marks]**



Answer _____

13 Work out the area of the trapezium under the graph between t = 0 and t = 16. **[4 marks]**



Answer _____

14 What does the gradient of the graph represent? **[2 marks]**

Answer _____

15 What does the area under a velocity-time graph represent? **[2 marks]**

Answer _____

Challenge

16 A train accelerates uniformly from rest to 15 m/s in 8 seconds, travels at that speed for 8 seconds, then decelerates uniformly to rest in 3 seconds. Draw the velocity-time graph (described) and work out the total distance. **[6 marks]**

Answer _____

17 A car decelerates from 10 m/s to rest in 3 seconds. Work out the distance travelled while stopping. **[4 marks]**

Answer _____

18 A cyclist accelerates at 2 m/s² for 5 seconds from rest and then travels at constant speed for 10 seconds. Work out the total distance. **[5 marks]**

Answer _____

19 The velocity of an object is 12 m/s at t = 0 and decreases uniformly to 0 at t = 8. Work out the distance travelled in this time. **[4 marks]**

Answer _____

20 A car's speed increases from 0 to 10 m/s with constant acceleration. It travels 30 m while accelerating. Work out the time this takes. **[5 marks]**

Answer _____