

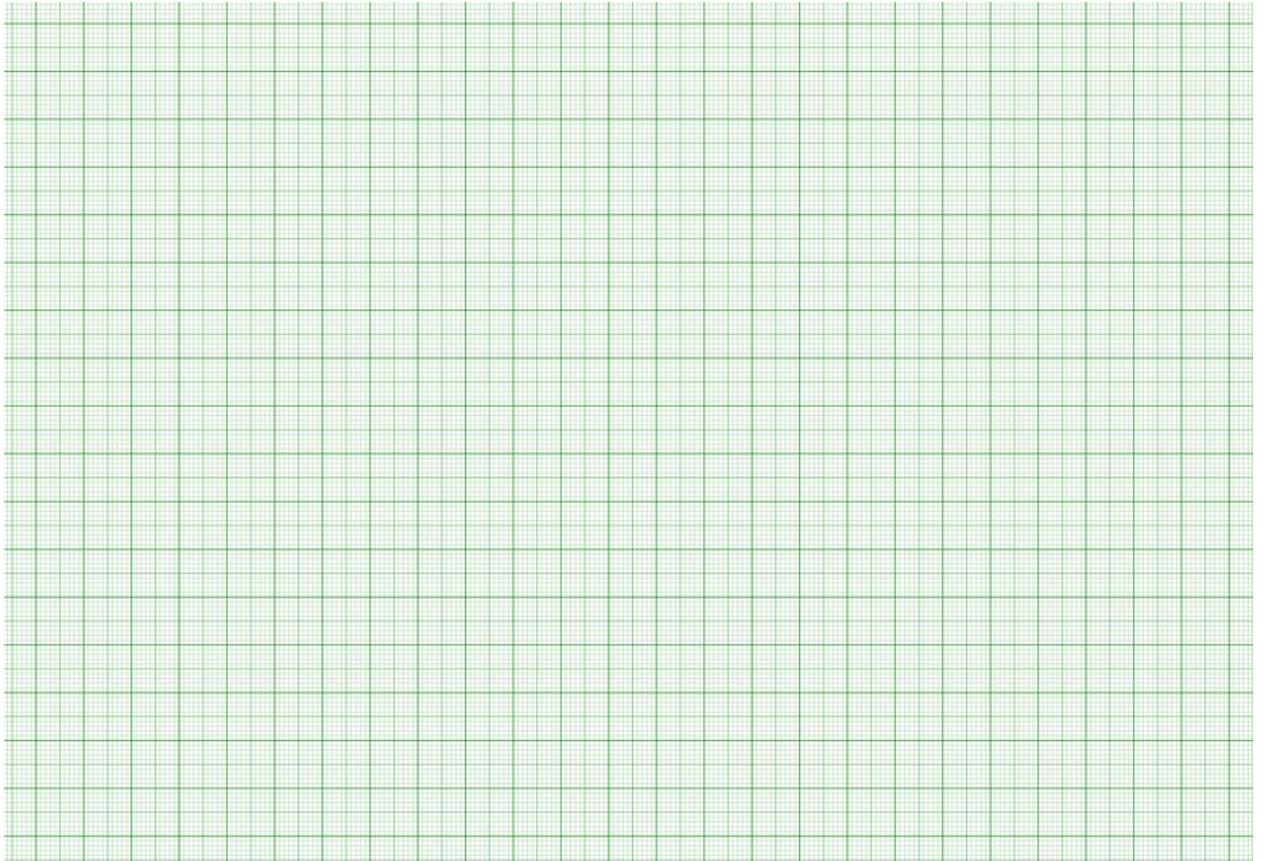


Velocity Time Graphs

1. The following table represents the movement of a car:-

Velocity (m/s)	0	5	10	15	15	15	12	9	6	3	0
Time (seconds)	0	1	2	3	4	5	6	7	8	9	10

Draw a Velocity time graph (with time on the x-axis)



Answer the questions below:

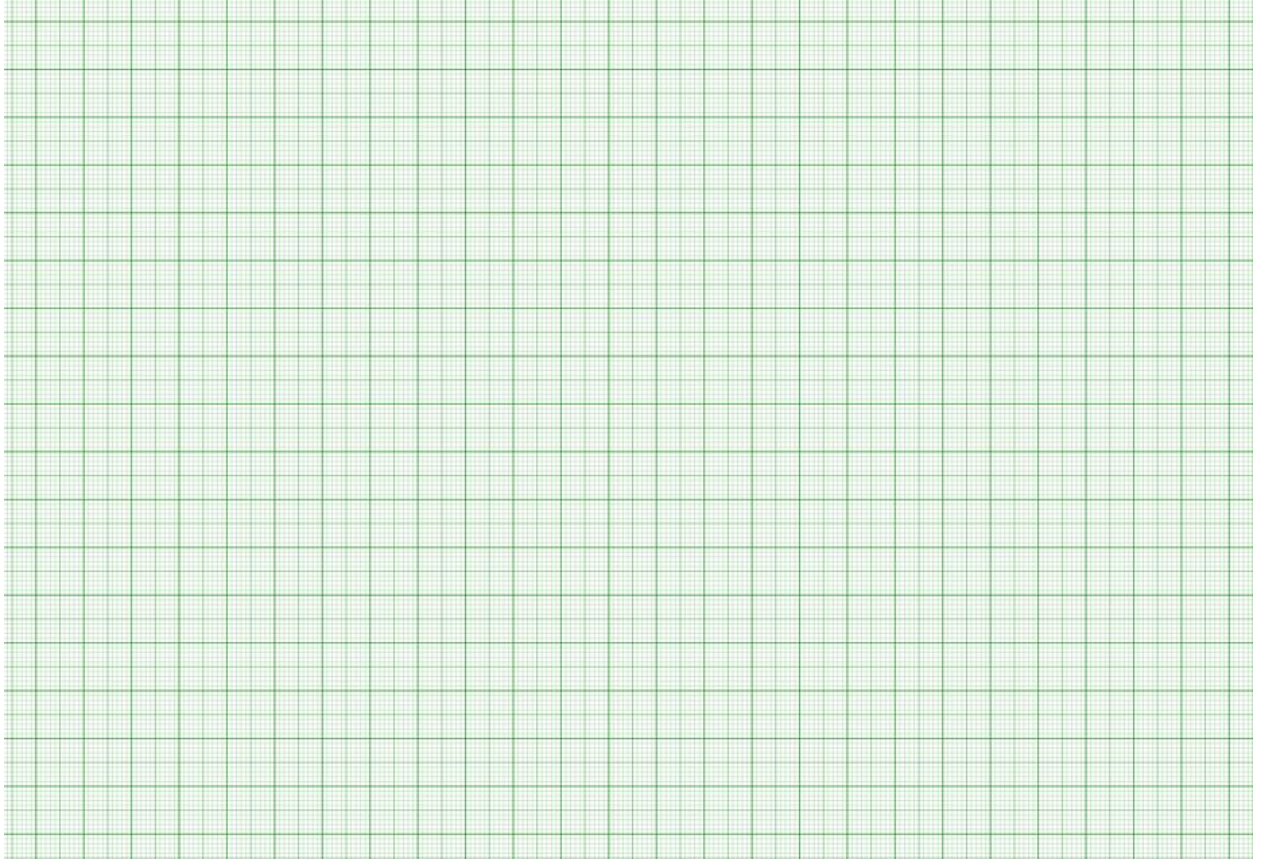
- What is the acceleration of the car between 0 and 3 seconds?
[Remember acceleration is equal to the change in velocity \div time]
- Between 3 and 5 seconds the car is still accelerating – true or false? Explain your answer.
- How would you describe the movement of the car between 5 and 10 seconds?
- What distance does the car travel in the first 3 seconds?
- What distance does the car travel in the total journey?



More difficult

2. A racing car (at rest) accelerates uniformly from the starting grid on the race track and reaches a top velocity of 30 meters/second/second after 5 seconds. For the next 4 seconds the acceleration is 0 and finally the car decelerates (brakes) at 4meters/second/second for 5 seconds.

Draw a Velocity time graph (with time on the x-axis). If you are stuck, try marking what the velocity would be after each second!



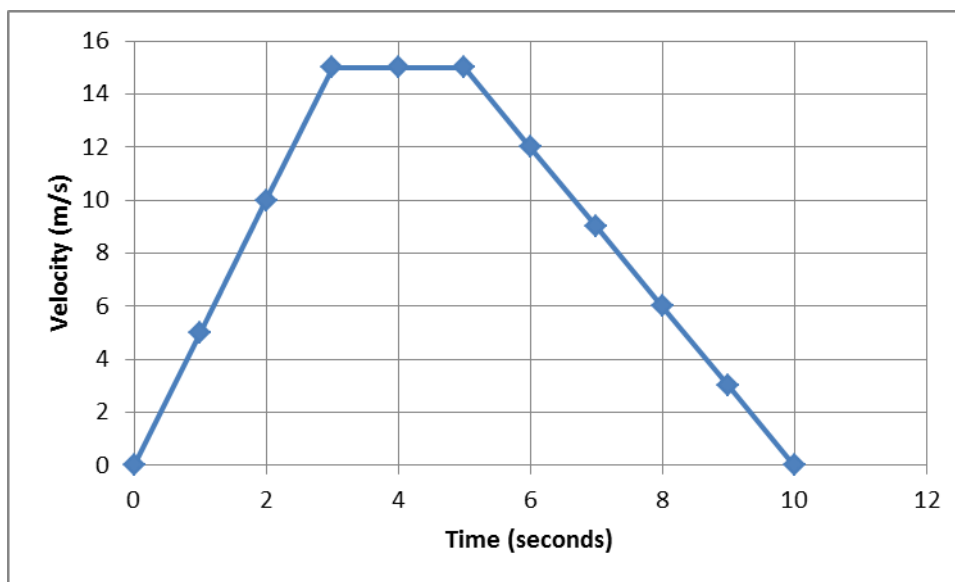
Answer the questions below:

1. What distance does the car travel in the first 5 seconds?
2. What is the velocity of the car after 7 seconds?
3. What is the velocity of the car after 14 seconds?
4. If the car carried on decelerating at 4m/s^2 , how many more seconds would it take before it came to a stop?
5. What is the acceleration in the first 5 seconds?



Answers!! Velocity Time Graphs

Velocity (m/s)	0	5	10	15	15	15	12	9	6	3	0
Time (seconds)	0	1	2	3	4	5	6	7	8	9	10

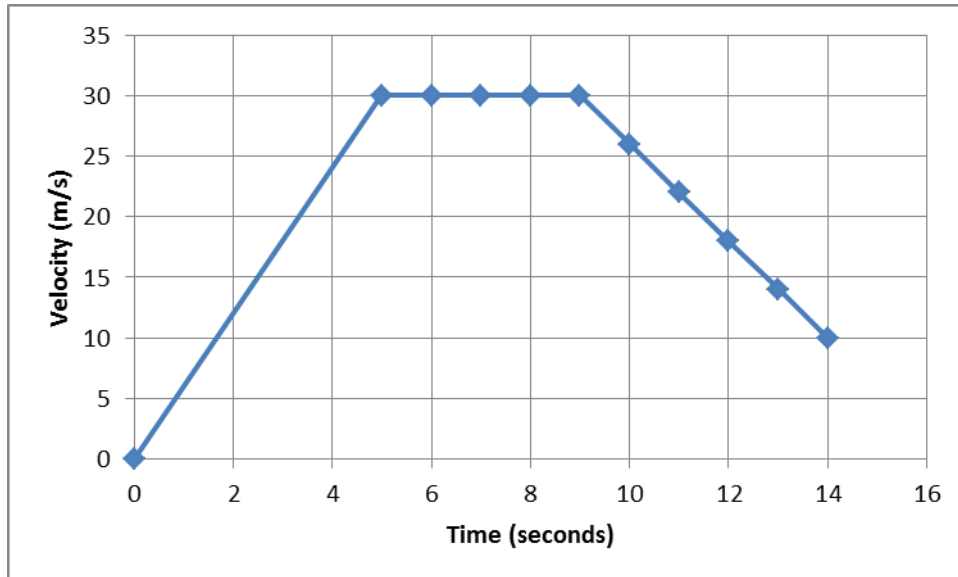


- What is the acceleration of the car between 0 and 3 seconds?
[Remember acceleration is equal to the change in velocity \div time]
Acceleration = $15 \div 3 = 5 \text{ m/s}^2$
- Between 3 and 5 seconds the car is still accelerating – true or false? Explain your answer. **False**
– constant speed of 15m/s
- How would you describe the movement of the car between 5 and 10 seconds?
Constant deceleration (of 3m/s^2)
- What distance does the car travel in the first 3 seconds?
Area of triangle = $(b \times h) \div 2 = 3 \times 15 \div 2 = 45 \div 2 = 22.5\text{m}$
- What distance does the car travel in the total journey?
Area of first triangle = 22.5m
Area of rectangle = $2 \times 15 = 30\text{m}$
Area of second triangle = $15 \times 5 \div 2 = 37.5\text{m}$ Total=90m



Answers!! More difficult

A racing car (at rest) accelerates uniformly from the starting grid on the race track and reaches a top velocity of 30 meters/second/second after 5 seconds. For the next 4 seconds the acceleration is 0 and finally the car decelerates (brakes) at 4meters/second/second for 5 seconds.



1. What distance does the car travel in the first 5 seconds?
Area of triangle = $5 \times 30 \div 2 = 75\text{m}$
2. What is the velocity of the car after 7 seconds? 30m/s
3. What is the velocity of the car after 14 seconds? 10m/s
4. If the car carried on decelerating at 4m/s^2 , how many more seconds would it take before it came to a stop? 2.5 seconds
(decreasing at a pace of 4m/s^2 , after 1 more second the speed would be 6m/s , after 2 more it would be 2m/s etc)
5. What is the acceleration in the first 5 seconds?
Gradient = change in velocity \div time = $30 \div 5 = 6\text{m/s}^2$