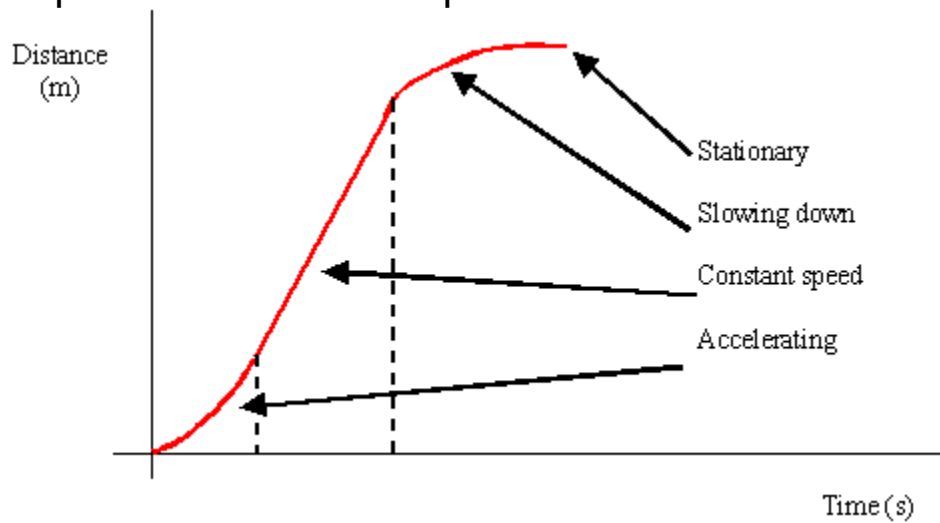


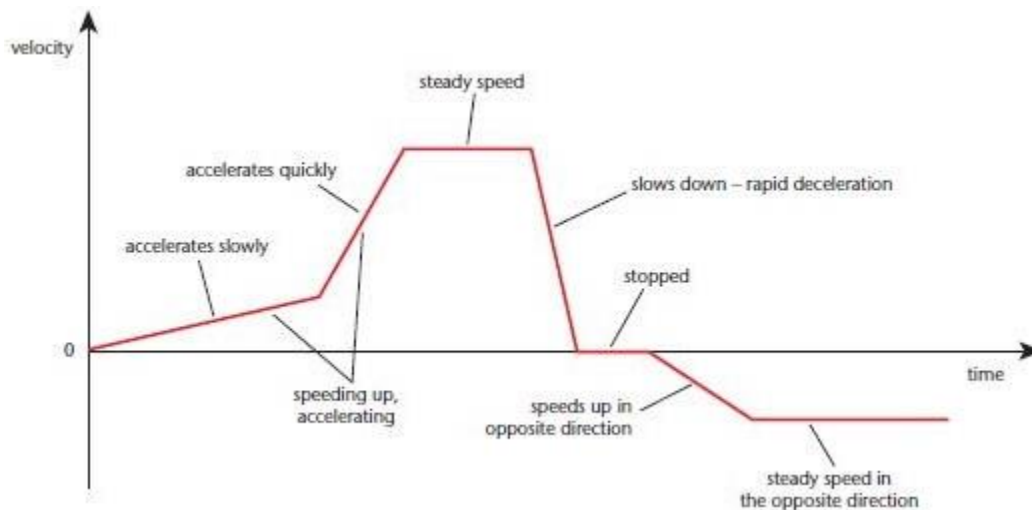
AP Physics 1- How to Read Position-Velocity-Acceleration Graphs

Displacement-Time Graphs



- When the object is stationary, the distance-time graph will be horizontal.
- The gradient of a distance-time graph is the instantaneous speed of the object.
- For straight line with positive gradient, it means that the object is travelling at uniform speed
- There is no straight line with negative gradient (as the distance never decreases)
- For curves, it means that the object is travelling at non-uniform speed.
- There is a straight line with negative gradient; it means that the object is travelling at uniform velocity in the opposite direction.

Velocity-time graphs



- When the object is stationary, it is a straight horizontal line at 0.

- When the object is undergoing uniform motion, it is a straight horizontal line at $v = m \text{ s}^{-1}$, where v is the velocity of the object.
- For straight line with **positive gradient**, it means that the object is **accelerating**.
- For straight line with **negative gradient**, it means that the object is **decelerating**.
- For curves, it means that the acceleration of the object is changing.
- The area under the graph is the change in displacement of the object.
- Below the origin indicates the opposite direction.

Acceleration-time graphs

- Area under graph is the change in velocity

The figure below shows the displacement-time graph, velocity-time graph and acceleration-time graph for the respective state of motion. It serves as a summary of the text above.

