

## 4. Representing Motion: Distance - Time Graphs

- Motion can be represented in a few ways:
  - Qualitatively, using descriptive **words**
  - Mathematically, using mathematical **equations** and **numbers**
  - Visually, using **graphs**
- Graph = used to communicate quantitative information visually
  - shows the relationship between two variables
  - can be used to express the motion of an object
- Distance vs Time Graph = shows the relationship between distance and time
  - **distance** is plotted on the y-axis and **time** is plotted on the x-axis
  - each point on the graph represents the object's **instantaneous speed**
  - these points when connected by a line of 'best fit', express the **average speed** of an object
- The Slope of a Distance vs Time Graph = Average Speed

$$\frac{\text{Rise}}{\text{Run}} \quad \text{or} \quad \frac{y_2 - y_1}{x_2 - x_1} \quad \text{or} \quad \frac{\Delta d}{\Delta t}$$

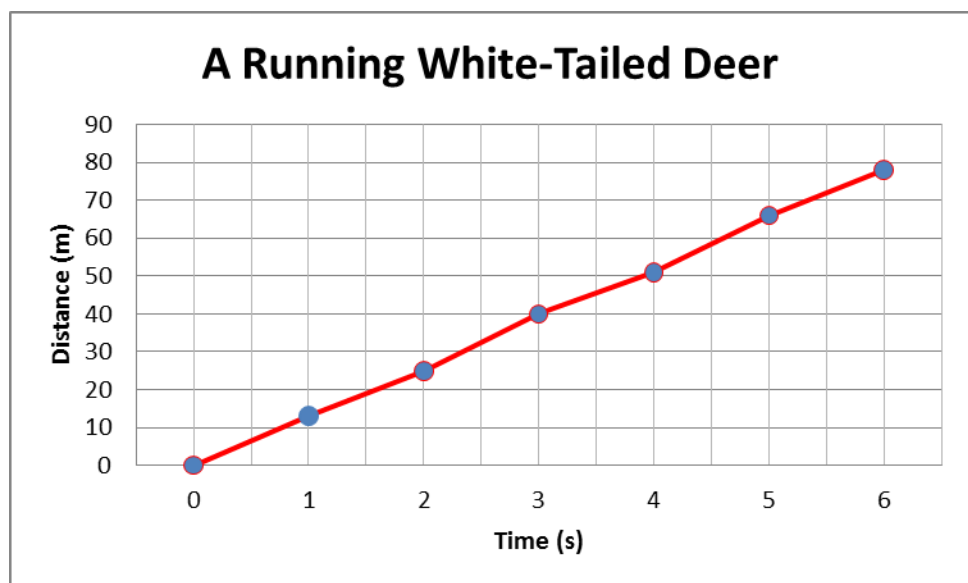
- **x & y** are coordinates of a point that is **on** your line of best fit = **instantaneous speed**

ie. Motion of a White-Tailed Deer

Time (s)	Distance (m)
0	0
1.0	13
2.0	25
3.0	40
4.0	51
5.0	66
6.0	78

Instantaneous speed of plot point 2  
= 12.5m/s

Average speed = 13.3 m/s



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Instantaneous speed of plot point 2:

Average speed :

