

Graph Matching

Video Notes

Two Questions

- If you're given a position-time graph for a motion, how do you identify what the velocity-time graph would look like?
- Or if you're given the v-t graph, how do you know what the p-t graph would look like?

The Strategy

Translate the position-time graph into words.
Then identify the shape of the velocity-time graph that is consistent with these words.



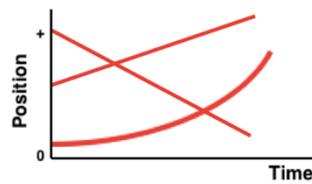
Position-Time Graphs <=> Verbal Descriptions

When you interpret a p-t graph you want to know the answer to 4 important questions ...

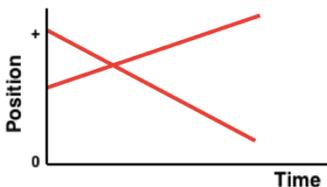
- Is the object at rest or moving?
- If moving, is the object moving with constant speed or changing speed?
- If changing its speed, is the object speeding up or slowing down?
- A + or - sign is often used to represent a direction of a vector like velocity. Is the velocity + or -?



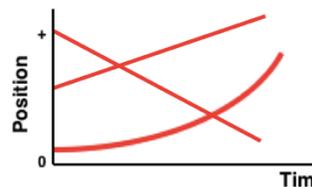
Object at Rest:
represented by
horizontal lines



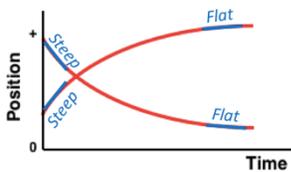
Moving Objects:
represented by
diagonal and curved
lines



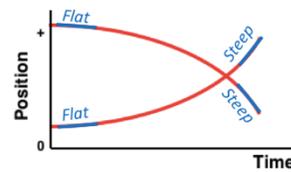
**Constant Speed
Objects:**
represented by
straight lines



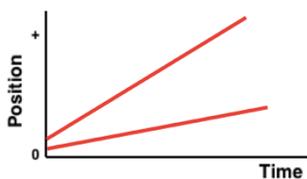
Moving Objects:
represented by
diagonal and curved
lines



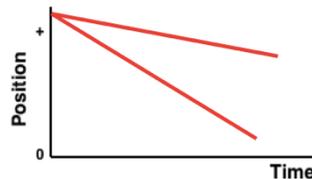
**Slowing Down
Objects:**
represented by lines
that get flatter



**Speeding Up
Objects:**
represented by lines
that get steeper

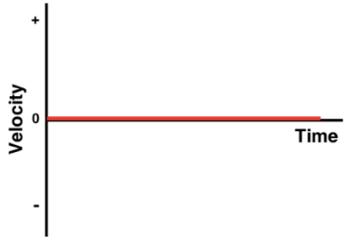


**Object Moving in +
Direction:**
represented by lines
with upward slope

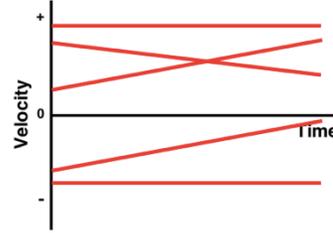


**Object Moving in -
Direction:**
represented by lines
with downward slope

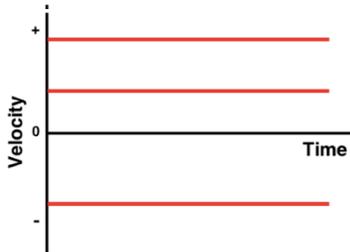
Velocity-Time Graphs <==> Verbal Descriptions



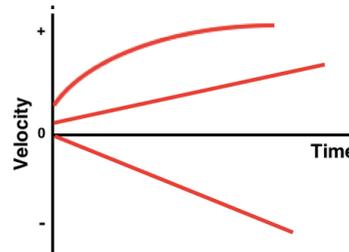
At Rest Objects:
represented by
horizontal lines on
the v=0 mark



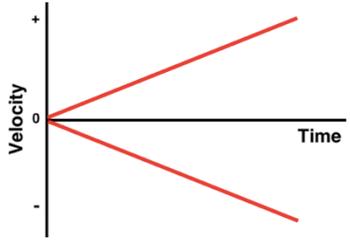
Moving Objects:
represented by lines
above or below the
time axis



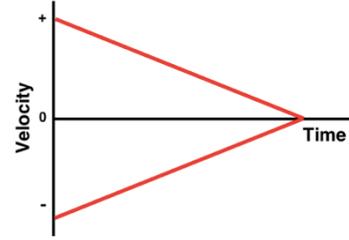
Constant Speed
Objects:
represented by
horizontal lines



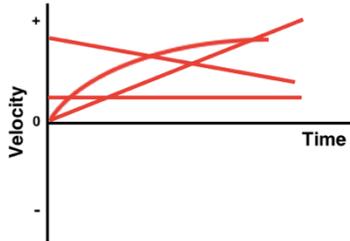
Changing Speed
Objects:
represented by
diagonal and
curved lines



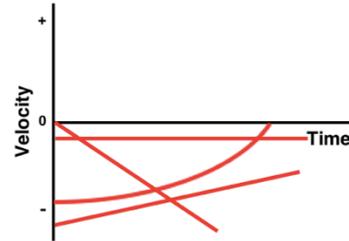
Speeding Up
Objects:
represented by lines
that get further from
the time-axis.



Slowing Down
Objects:
represented by lines
that get closer to the
time-axis.

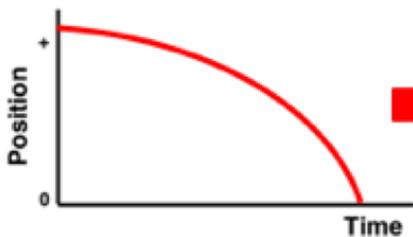


Object Moving in
+ Direction:
represented by lines
in the + region
(above axis)



Object Moving in
- Direction:
represented by lines
in the - region
(below axis)

Example:



The object is:
moving
changing speed
speeding up
moving in - dir'n

