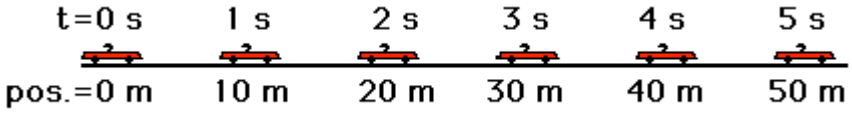
PT Graphs Lecture Guide

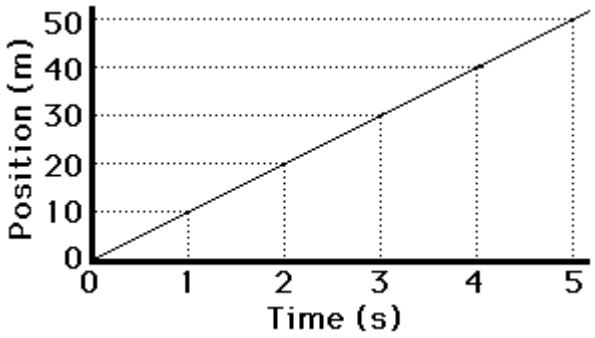
EN: ____

_____ vs _____

Consider a car moving with a _____, _____

_____ - say of +10 m/s.

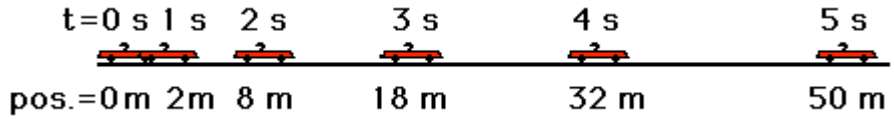


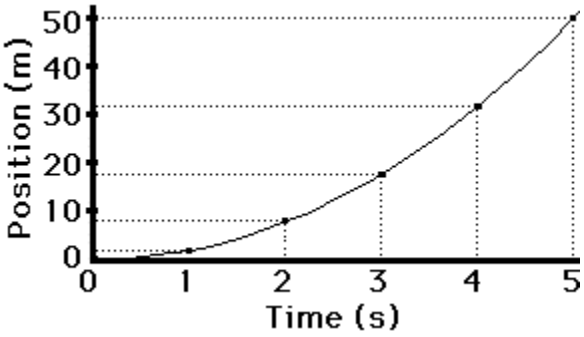


If the position-time data for such a car were graphed, then the resulting graph would look like the p – t graph at the right.

_____, _____ velocity results in a line of _____ and _____ slope

Now consider a car moving with a _____,_____ _____ that is, a car that is moving rightward but speeding up or _____.



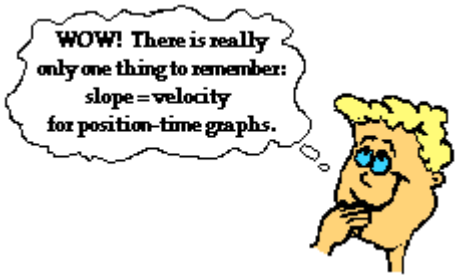


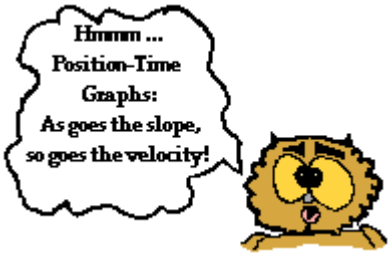
_____, _____ velocity results in a line of _____ and _____slope when plotted as a p-t graph.

position vs. time graphs for the two types of motion

Constant, Positive Velocity

Positive, Changing Velocity (acceleration)

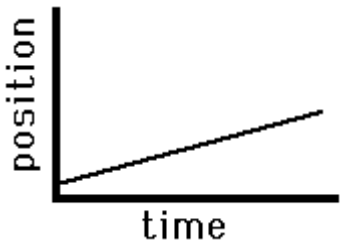


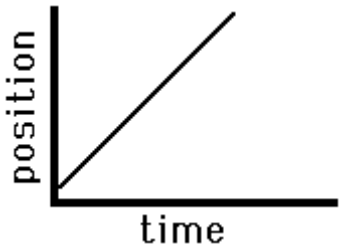


PRINCIPLE FOR SLOPE: For P-T graphs: Slope = Velocity

- If the velocity is _____, then the slope is _____ (i.e., a straight line).
- If the velocity is _____, then the slope is _____ (i.e., a curved line).
- If the velocity is _____, then the slope is _____ (i.e., moving upwards and to the right).
- If slow/small velocity then _____ slope. If fast/large velocity then _____ slope

_____ _____

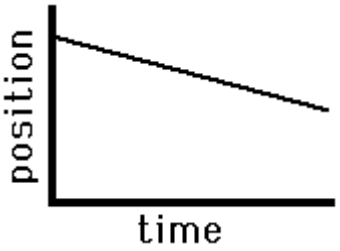


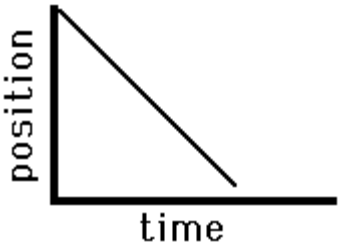


If a negative velocity then _____ negative slope, If a constant velocity then _____slope

If a small velocity then _____ slope, If a large slope then _____ velocity

_____ _____





If a Curved line then a _____ slope = _____ or changing velocity

may start with a very small slope and begin curving sharply (either upwards or downwards) towards a large slope.

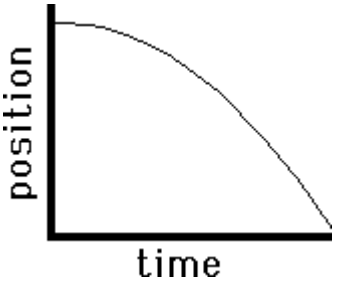
If negative velocity then _____ slope

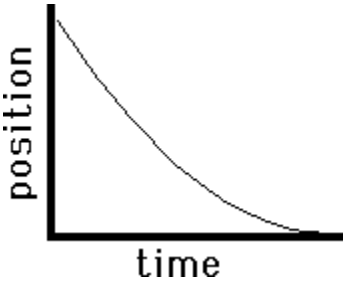
If a small velocity then _____ slope , If a large velocity then _____ slope

If _____ _____ : moving in the negative direction and speeding up.

If _____ _____: moving in the negative direction and slowing down.

_____ _____





See Animations of Various Motions with Accompanying Graphs : GIF Passing Lane

Slope for a p-t Graph = Velocity

slope = velocity

a small slope means a _____ velocity

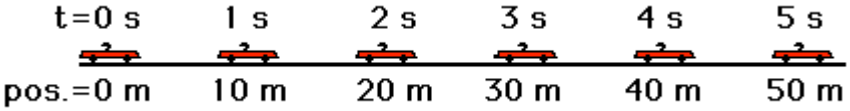
a negative slope means a _____ velocity

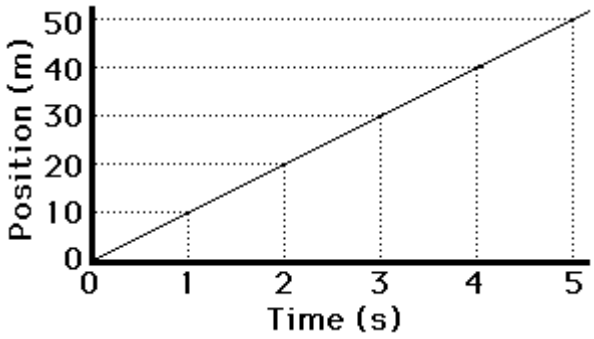
a constant slope (_____ line) means a _____ velocity

a changing slope (_____ line) means a _____ velocity.

How does the actual slope value of any straight line on a graph give the velocity of the object?

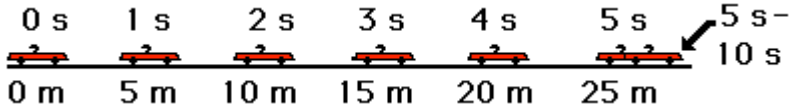
Consider a car moving with a constant velocity of +10 m/s for 5 seconds. The diagram below depicts such a motion.

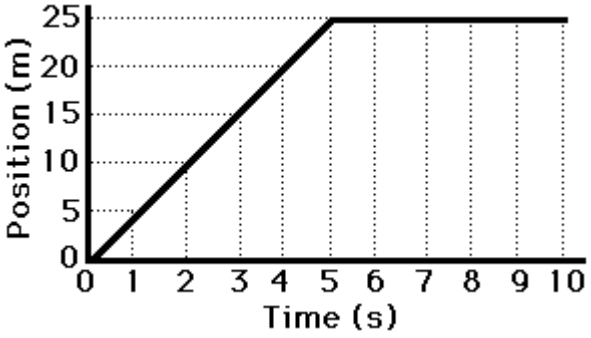




Calculate the slope of the line above:

Now consider a car moving at a constant velocity of +5 m/s for 5 seconds, abruptly stopping, and then remaining at rest (v = 0 m/s) for 5 seconds.





Calculate the velocity for the first 5 sec interval.

Calculate the velocity for the second 5 sec interval.