

Figure 6 The speedometer in a car measures the car's instantaneous speed. Note the scale markings are given both in km/h and miles per hour, mph.

Figure 7 The slope of the line on a distance-time graph indicates the speed of the object. **Using Graphs** If the car in Figure 7A required less time to travel a given distance, how would the slope change?

Instantaneous Speed Average speed is useful because it you know how long a trip will take. Sometimes however, such as driving on the highway, you need to know how fast you are going particular moment. The car's speedometer gives your instantant speed. **Instantaneous speed**, v, is the rate at which an object is more at a given moment in time. For example, you could describe the intaneous speed of the car in Figure 6 as 55 km/h.



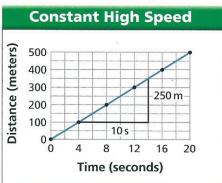
What does a car's speedometer measure?

Graphing Motion

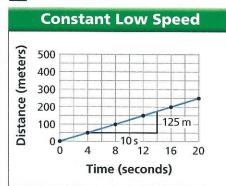
A distance-time graph is a good way to describe motion. Figure 7 distance-time graphs for the motion of three cars. Recall that slow the change in the vertical axis value divided by the change the horizontal axis value. On these graphs, the slope is the change distance divided by the change in time. The slope of a line on a tance-time graph is speed. In Figure 7A, the car travels 500.0 meters 20.0 seconds, or 25.0 meters per second. In Figure 7B, another car els 250.0 meters in 20.0 seconds at a constant speed. The slope line is 250.0 meters divided by 20.0 seconds, or 12.5 meters per sea Notice that the line for the car traveling at a higher speed is steeped steeper slope on a distance-time graph indicates a higher speed.

Figure 7C shows the motion of a car that is not traveling constant speed. This car travels 200.0 meters in the first 8.0 sec It then stops for 4.0 seconds, as indicated by the horizontal part line. Next the car travels 300.0 meters in 8.0 seconds. The times the car is gradually increasing or decreasing its speed are by the curved parts of the line. The slope of the straight portion the line represent periods of constant speed. Note that the car's is 25 meters per second during the first part of its trip and 38 per second during the last part of its trip.





В



C

