4/12/2017

6 Acceleration PPT

Question: If a speeder is traveling at 75 m/hr and the police is not moving, how is it possible for a police car to actually catch the speeder?

1) Question & TOC
2) Discuss car on ramp lab
3) PPT notes
4) Reflection

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The Police and Speeder

Slope, Triangles, and the X/t Graph

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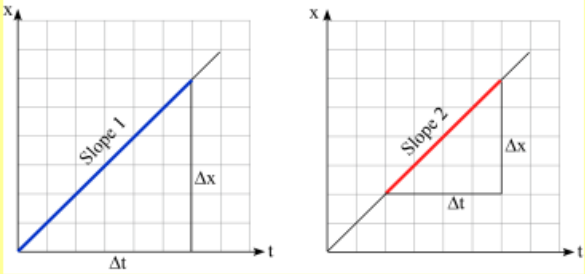
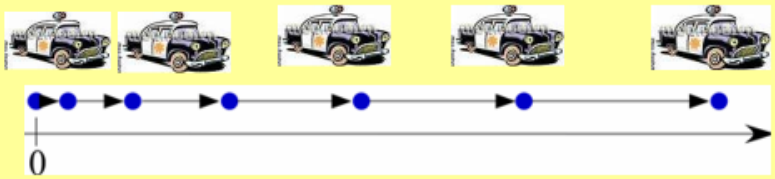


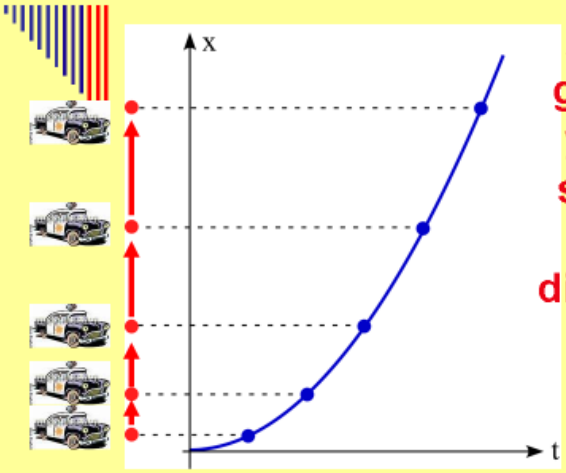
While the length of the blue line is longer than the red line, both have the same slope and therefore show the same constant velocity.

This motion diagram indicates that the police car has an increasing velocity.



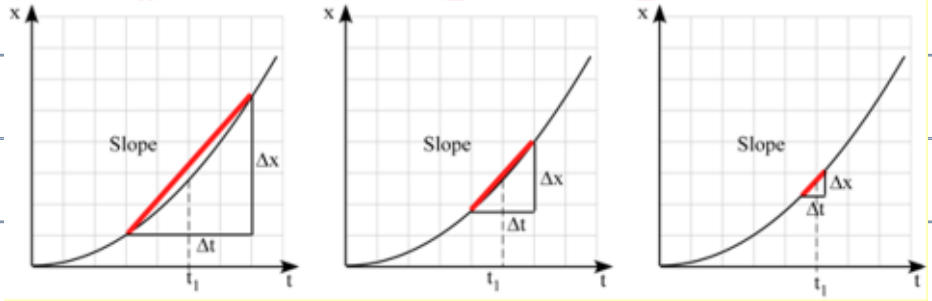
If turned vertically, the motion diagram would look like this…

The new vertical motion diagram also demonstrates increasing velocity

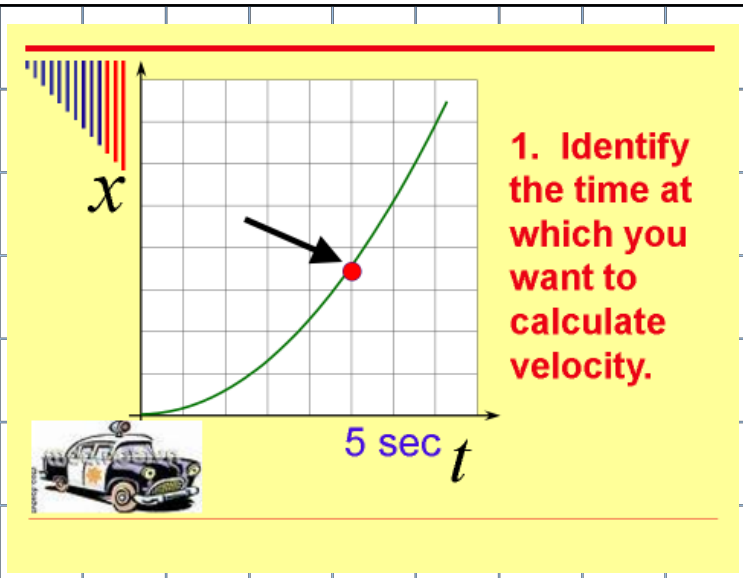


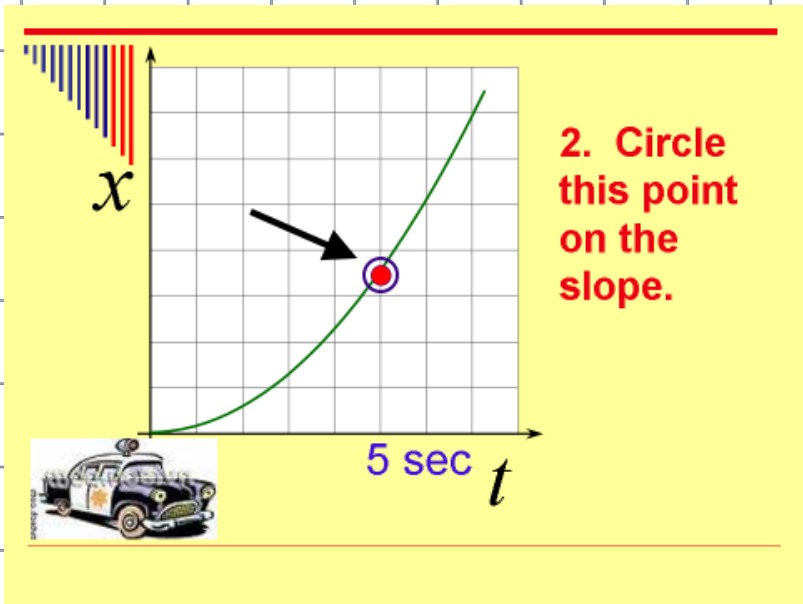
Add the graph, & you can see how motion diagrams and X/t graphs relate.

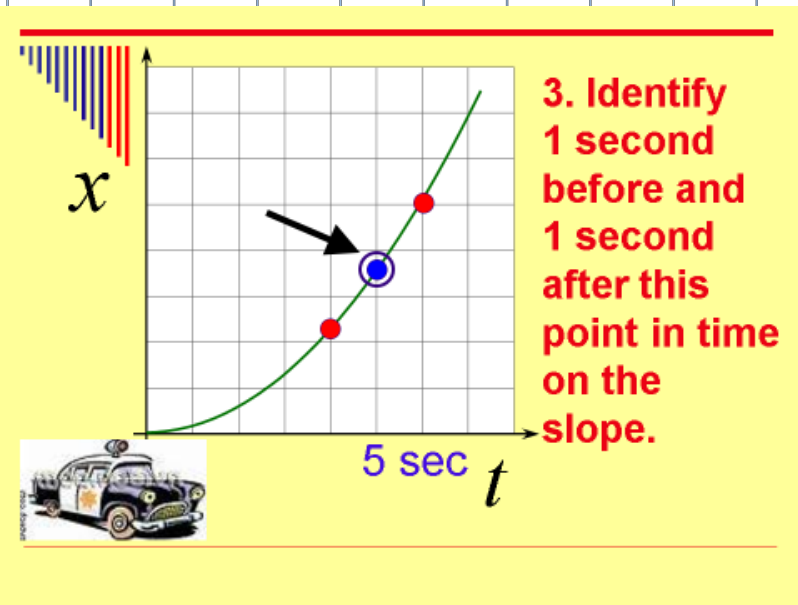
TBI: If we can place the slope of the triangle along the curve



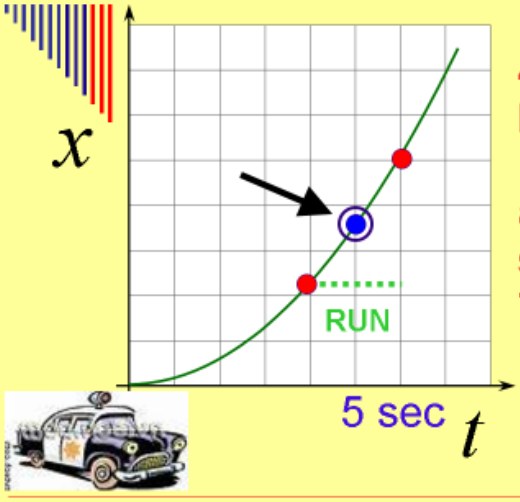
Then we can determine the velocity at a specific time…but as the triangle gets smaller, so does the accuracy.


x
5 sec
t
1. Identify the time at which you want to calculate velocity.


x
5 sec
t
2. Circle this point on the slope.


x
5 sec
t
3. Identify 1 second before and 1 second after this point in time on the slope.

Aug 19-8:59 AM



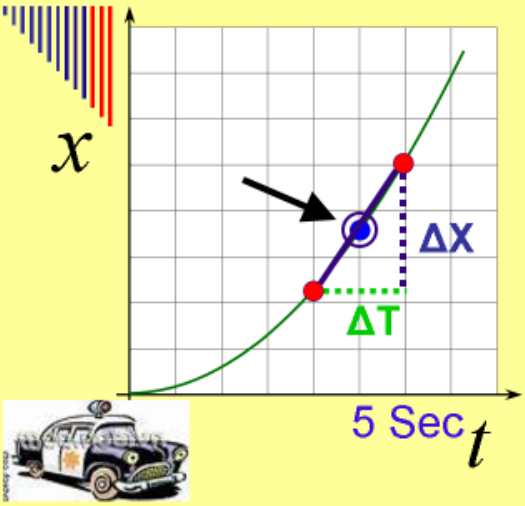
4. Draw a line from the 1st point across 2 seconds. This is the RUN.

5. Draw a line from the base up to the 2nd point. This creates the RISE on the triangle.

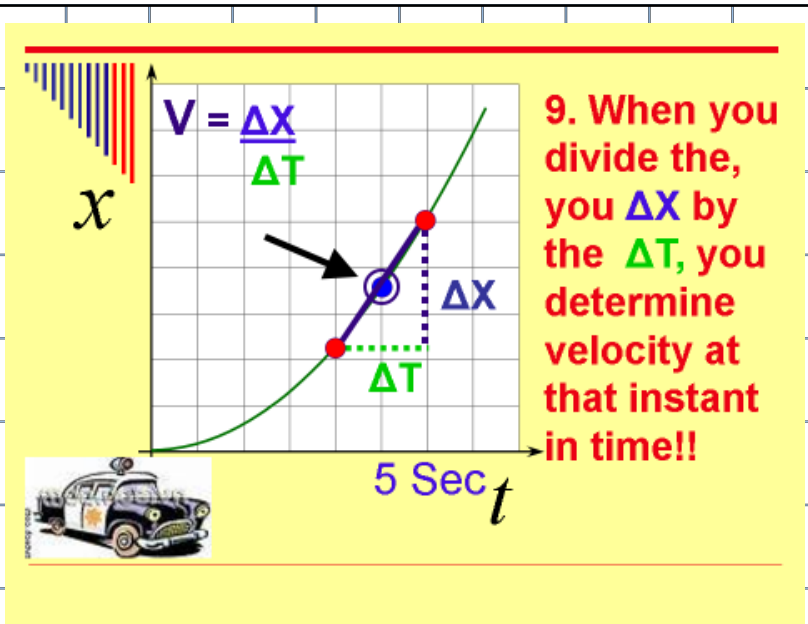
6. The Secant between the points is the slope at that instant in time!!

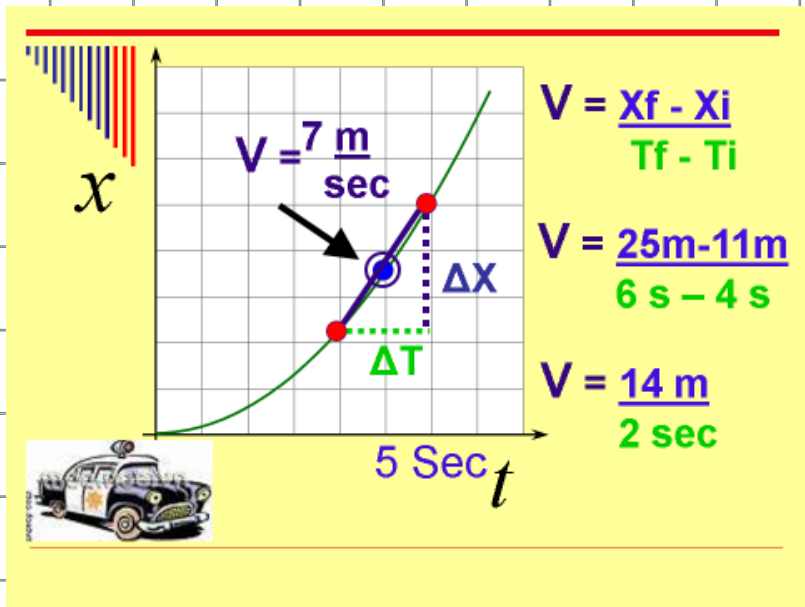
Aug 19-8:59 AM

7. Now determine the rise or ΔX for this slope.



8. Next, find the run or ΔT for this slope.


V = ΔX / ΔT
x
ΔX
ΔT
5 Sec
t
9. When you divide the, you ΔX by the ΔT, you determine velocity at that instant in time!!


V = 7 m / sec
x
ΔX
ΔT
5 Sec
t
V = Xf - Xi / Tf - Ti
V = 25m-11m / 6 s – 4 s
V = 14 m / 2 sec

Attachments

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