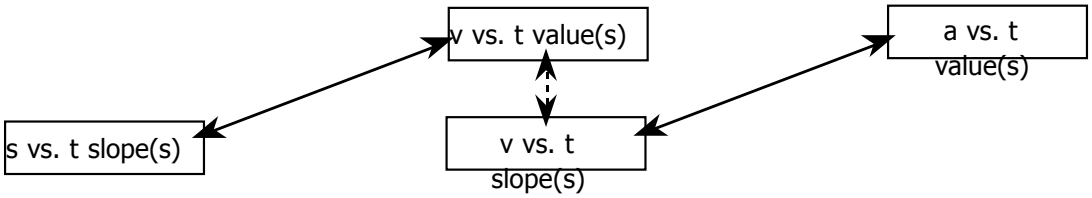
One Way to "Solve" Position, Velocity and Acceleration Versus Time Plots



An Example of v vs. t --> a vs. t and v vs. t --> s vs. t:

1. Divide the plot into regions of "different" motion.

2. Determine the direction of the motion in each region (fwd/v+, bkwd/v–) and if the object is speeding up, slowing down or moving at a constant speed.

3. Determine the slope of the plot in each region.

4. **a vs t plot** : Use slope of v vs. t ($\Delta v/\Delta t = a$) to determine the sign of the acceleration in each region. CHECK: Is the sign of "a" consistent with the direction of a "shove" that is required to produce that motion? (Moving fwd/slowing down requires a "backwards" (negative) shove!)

5. **s vs. t plot** :
A. Set the position (s value) at the beginning and end of each interval (Pts. A1, A2, A3) so that Δs (fwd/+, bkwd/–) is consistent with the direction of motion indicated on the v vs. t plot.

B. Sketch "slope tangents" (B1, B2, B3) at each point that represents the sign of the velocity ($\Delta s/\Delta t = v$).

C. Draw a smooth curve that reflects the correct transitions from one "slope tangent" to the next.