

Warm Up: Graphical Analysis of Kinematics

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1 Memory Bank

1. $v = \frac{\Delta x}{\Delta t}$... Average velocity.
2. $x(t) = vt + x_i$... Position versus time with constant velocity.
3. $a = \frac{\Delta v}{\Delta t}$... Acceleration is the change in velocity.
4. $v_f^2 = v_i^2 + 2a\Delta x$... Kinematic equation without time.

2 Graphical Analysis of Kinematics

1. Consider the motion of the runner depicted in Fig. 1. (a) What is the speed of the system after $t = 4$ seconds? (b) What is the acceleration between $t = 0$ and $t = 4$ seconds? (c) What is the speed of the runner between $t = 0$ and $t = 4$ seconds?
2. Now change the y-axis units in Fig. 1 to velocity, in meters per second. Answer parts (a)-(c) from the previous question again. For part (c), write your answer as a function of time.

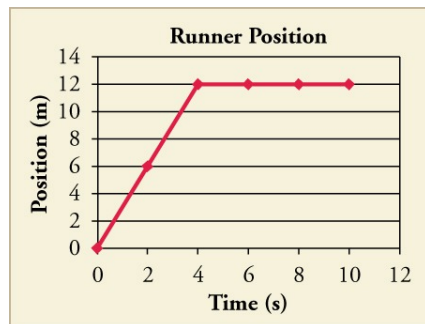


Figure 1: (Left) A system moves with constant velocity. Velocity is the slope on this plot. (Right) A system moves with non-constant velocity.