Interpreting and Sketching Graphs of Motion

Understanding the motion of an object is often best understood and described by looking at or producing graphs of the position, velocity, and/or acceleration of the object as time progresses; x vs t, v vs t and a vs t graphs.

For Example

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| **Description** | **Position vs time** | **Velocity vs time** | **Acceleration vs time** |
| The position vs time graph of an object that starts at the origin and moves in the positive direction at a constant velocity would have the following set of graphs |  | The faster the object moves, the further away from the x axis the velocity will be | Velocity does not change so a = 0 |
| An object starts to the right of the origin and moves at constant speed toward the origin and stops at the origin |  |  |  |
| An object starts to the left of the origin and moves in the negative direction at a constant speed. |  |  |  |
| ?? |  |  |  |
| Object starts at origin and ??? |  |  |  |

**For motion that involves an object changing speed, or accelerating, graphs can also be used to understand and describe the motion.**

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| A cart is pushed up a ramp |  | |  | |  | |
| Cart goes down a ramp and onto a flat track |  | |  | |  | |
| Cart starts at rest and rolls toward the origin and stops at the origin | |  | |  | |
| (above situation) |  | |  | |  | |