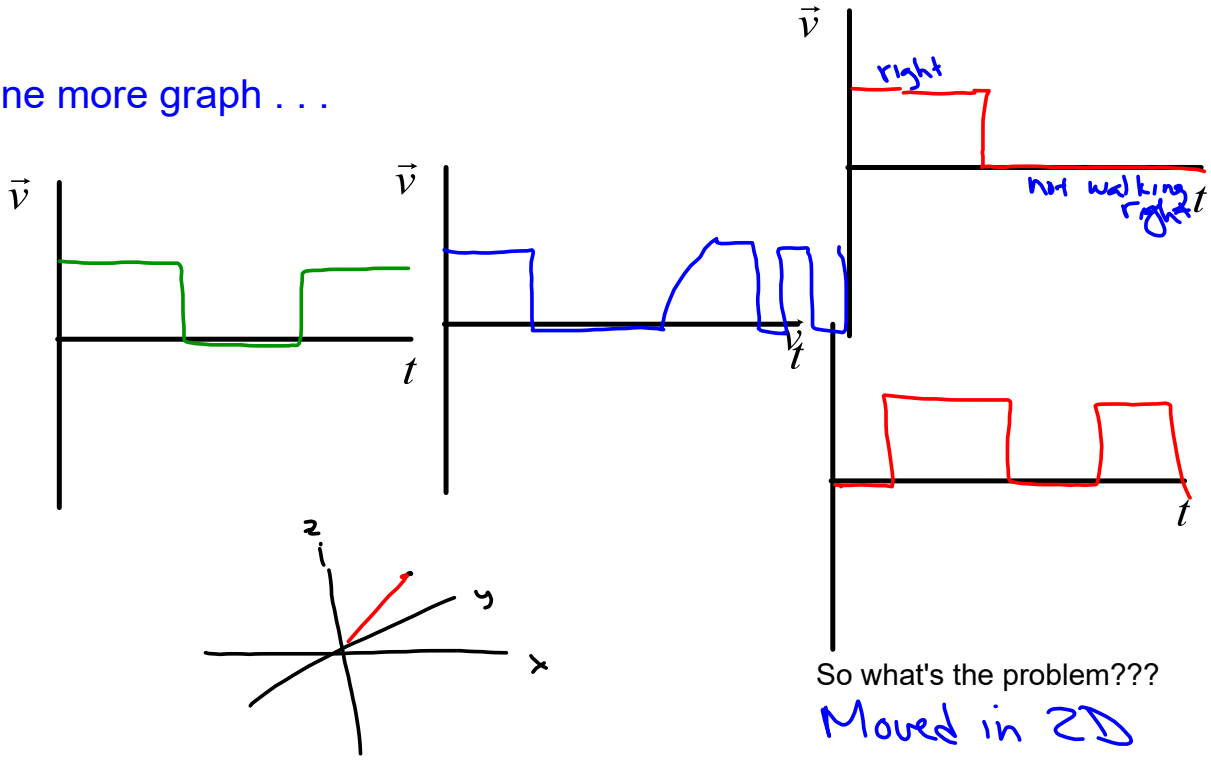
One more graph . . .

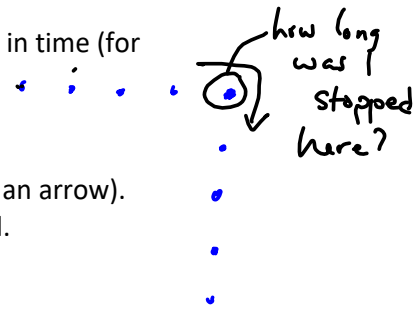


So what's the problem???

Moved in 2D

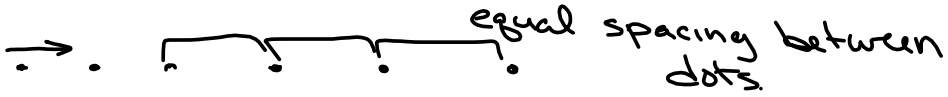
Dot Diagrams

- Use dots to represent the location at the image at moments in time (for example 1 dot every second).



- Advantage - Show position in 2-D at any point in time.
- Disadvantages - Doesn't show direction (can be fixed with an arrow).
  - Don't know how long an object is stopped.

Object moving at constant speed

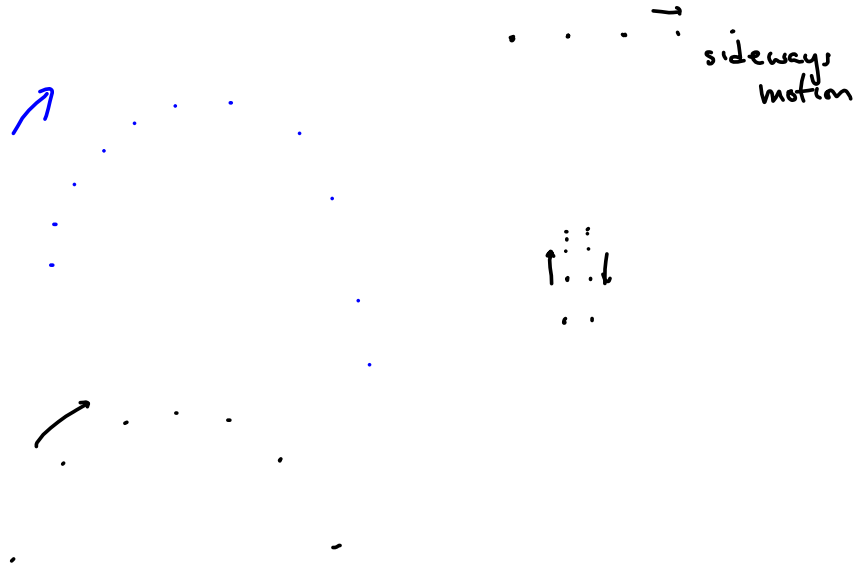


Falling object speeding up

Increased spacing → more d, same t means faster.

Object slowing down because of friction

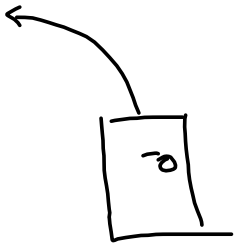
Projectile



Frames of Reference

A ***frame of reference*** is essentially the point of view of an observer. Motion looks different from different frames of reference.

There is no absolute frame of reference.



1) Have one member of the group walk at a constant speed.
   a) Describe the motion from the point of view of someone standing behind the person walking (i.e. how does the distance between the two people change as time passes). Show this in a dot diagram.
   b) Have an observer walk alongside the first person. Describe the motion from this point of view. (It may help to imagine a completely black background so that all you can see is the person walking).
   c) Have an observer running toward the person walking. Describe the motion of the walker from the point of view of the runner (i.e. how does the distance between the two change as time passes). Show this in a dot diagram.

2) Standing still, toss a small object (eraser, ball, pencil) into the air and catch it.
   a) Describe this motion from the perspective of someone standing still. Show the motion in a dot diagram.
   b) What does a person walking past the object see? Show the motion in a dot diagram.

3) Walk at a constant speed. Toss an object up in the air and catch it.
   a) Describe the motion from the perspective of the person tossing the ball. How (or does) this differ from case 2) a)?
   b) Describe the motion from the perspective of a person standing still. Draw a dot diagram.

4) Imagine you are on a bus moving at a constant speed. A person standing jumps up in the air and lands at the same spot on the bus. Draw a diagram indicating what a person standing outside the bus would see.

Homework

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