## Distance-Phase diagrams

A point *P* moves across a two-dimensional map along various paths.

At any moment in time, it is a distance *x* from point *A* and a distance *y* from point *B*.

These distances are marked on a graph as the point (*x,y*)

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| Map | Cartesian (*x,y*) graph. |

1. Suppose *P* moves along a straight line on the map.   
   What will its graph look like?  
   Try to justify all your conjectures.  
   Try this for various straight lines until you have exhausted the possibilities.
2. Suppose *P* moves across the graph along a straight line.  
   What could it be doing on the map?  
   Try to justify all your conjectures.  
   Try this for various straight lines until you have exhausted the possibilities.
3. Now suppose *P* moves in a circle ……
4. What about when *xy* = constant?
5. ..and for masochists … you may like to try to prove your conjectures algebraically.