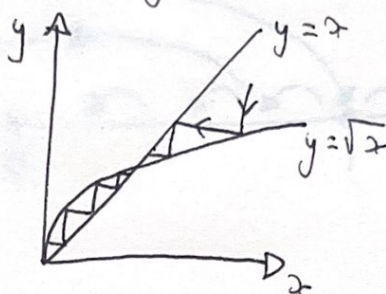
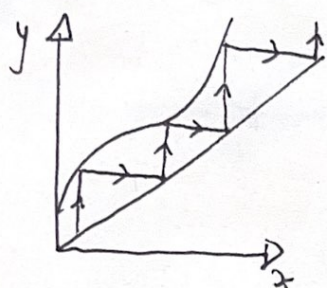


16/05

4.1 ~ Graphical Analysis

This is used to analyze the orbits of x_0 graphically. You plot the function $F(x)$ and $y=x$, and then simply iterate.

↳ These are called Cobweb diagrams.



Any positive x_0 leads to the point of intersection of the two graphs. That is, the fixed points. !This is not always true!

⚠ Graph. Analysis does not allow us to decipher the behavior of all orbits!

4.2 ~ Orbit Analysis

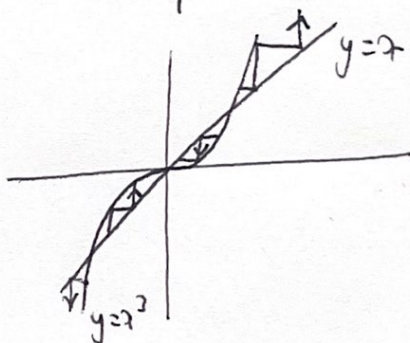
Consider $F(x) = x^2$.

• For $|x_0| < 1$, the orbit of x_0 tends to zero.

• For $|x_0| > 1$, the orbit of x_0 tends to $\pm \infty$.

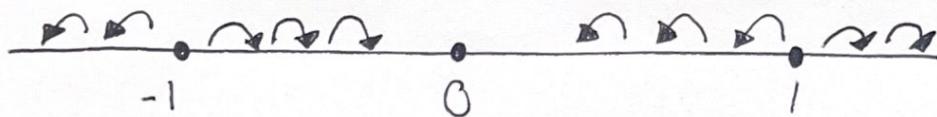
∴ we've accounted for behaviour of the orbits of all points.

∴ we have completed a complete orbit analysis.



4.3 ~ Phase Portrait

①: $F(x) = x^3$



②: $F(x) = x^2$

