

Outline

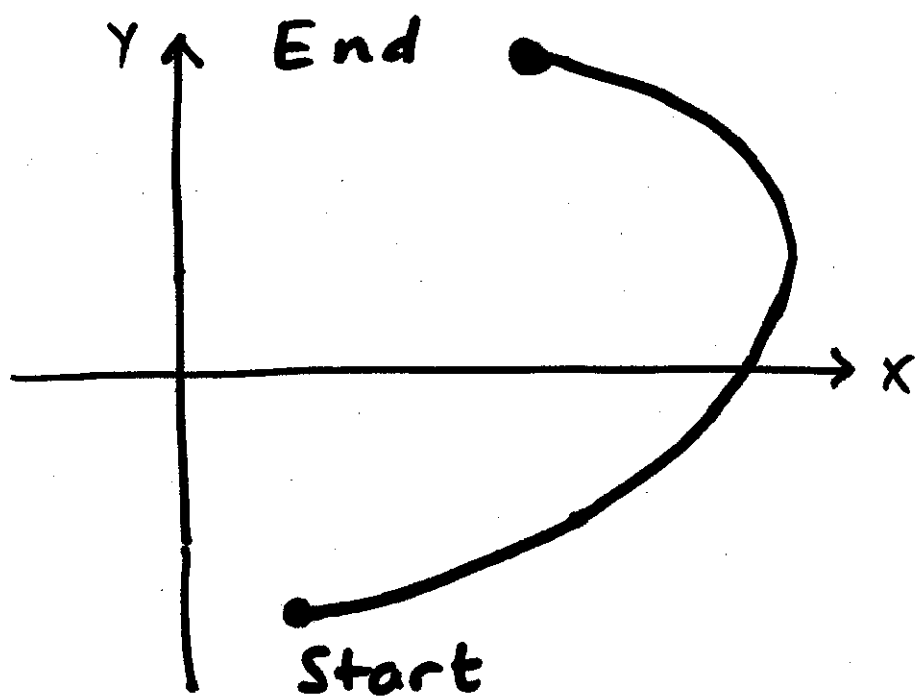
1. Concept of parametric curves
2. Equations for circles.
3. Equations for lines.

Do-over: 12/4/08 7pm, 8pm, 9pm
2315 DH

Final: 12/12/08 8:30am - 11:30am

1. Concept of Parametric Equations:

- Consider a curve in the xy plane:



would be impossible to describe using a function $f(x)$ because it fails the vertical line test.

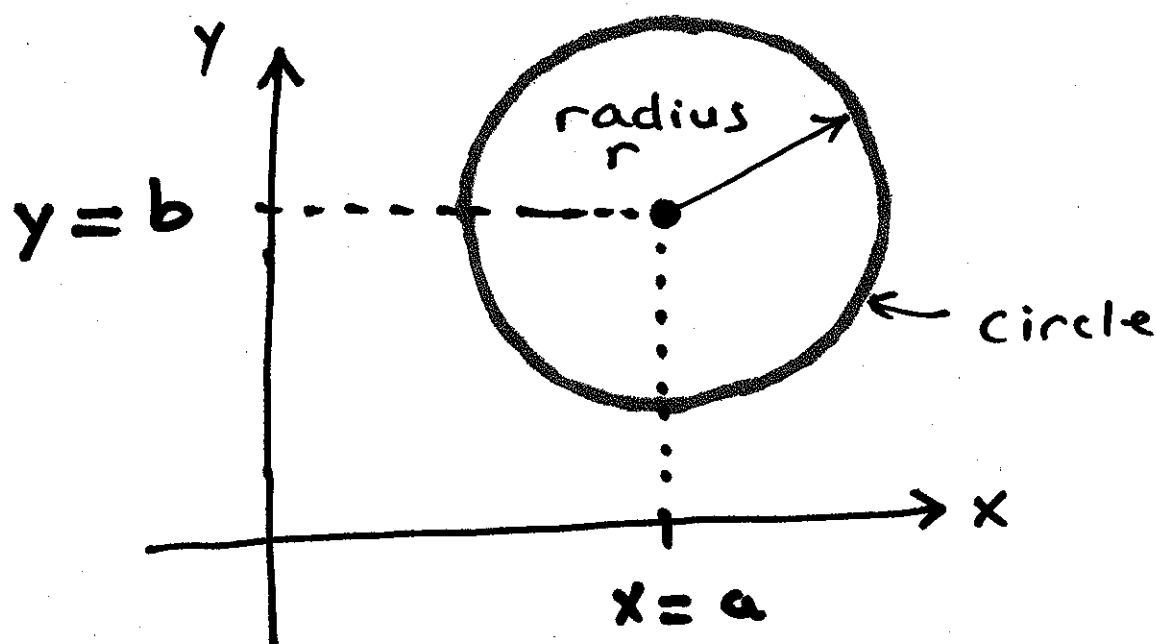
- Parametric equations are a tool for describing curves like

this using a pair of functions
on an interval.

- To describe a curve, need:
 - A function $x(t)$ that gives the x -coordinate of the point on the curve reached at time ' t '
 - A function $y(t)$ that gives the y -coordinate of the point on the curve reached at time ' t '
 - An interval of t -values that correspond to the time interval when the journey takes place.

2. Equations for a Circle

- Circle centered at (a, b) with radius r :



- Parametric equations:

$$x(t) = a + r \cdot \cos(t)$$

$$y(t) = b + r \cdot \sin(t)$$

Interval: Whole circle $[0, 2\pi]$

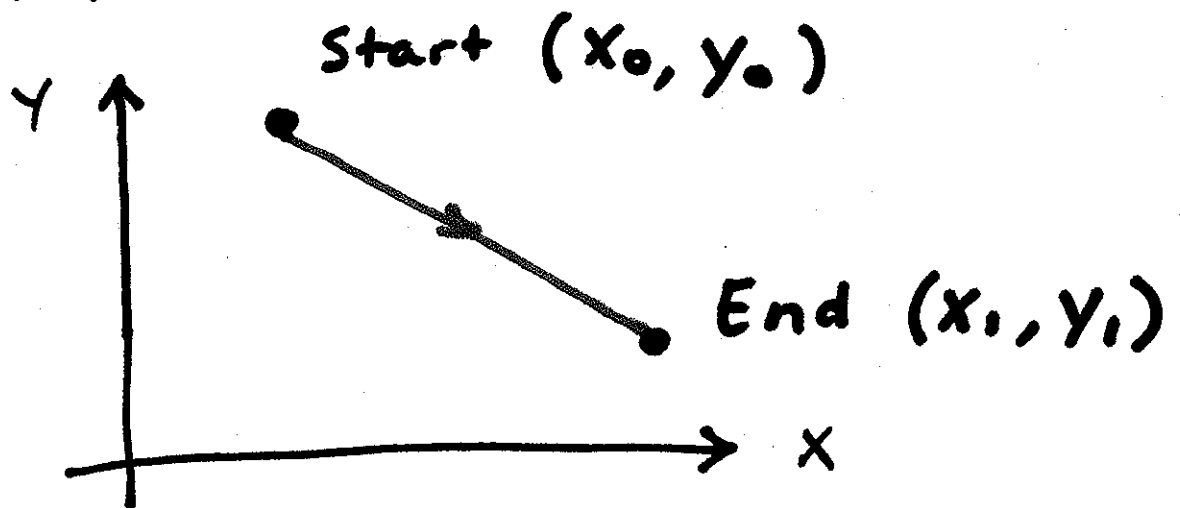
Top half $[0, \pi]$

Bottom half $[\pi, 2\pi]$

etc.

3. Equations for a Straight Line Segment.

- Straight line segment starting at (x_0, y_0) and ending at (x_1, y_1) .



- Parametric equations:

$$x(t) = (1-t) \cdot x_0 + t \cdot x_1$$

$$y(t) = (1-t) \cdot y_0 + t \cdot y_1$$

Interval: Always $[0, 1]$.