Example

Consider the following two parametric curves:

$$\begin{cases} x = 2-2t \\ y = 3+t^2 \end{cases} \qquad \begin{cases} x = 2t-4 \\ y = t^2 \end{cases}$$

Do these curves intersect? If so, where?

Solution Attempt:

$$\begin{cases} 2-2t = 2t-4 \\ 3+t^2 = t^2 \end{cases}$$

This has no solutions (look @ second equation).

⚠ These equations do not solve for an intersection; they solve for a collision

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same place (but not necessarily same time)

same place & same time

Corrected solution:

$$\begin{cases} 2-2t = 2s-4 \\ 3+t^2 = s^2 \end{cases}$$

Rearrange first eq: $t = 3-s$

Substitute into second:

$$3+(9-6s+s^2) = s^2$$

$12 - 6s = 0$

$s = 2$ and $t = 1$.

Check: $2 - 2t = 0$ $\quad$ $2s - 4 = 0$

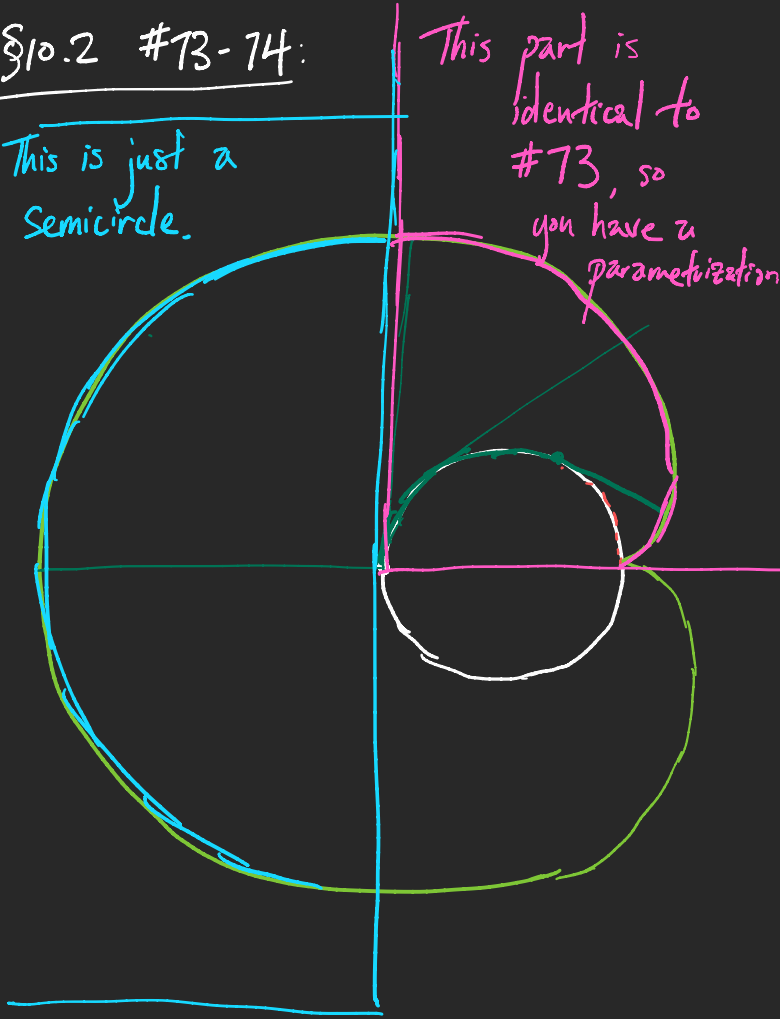
$3 + t^2 = 4$ $\quad$ $s^2 = 4$

Food for thought: How would you find a point of self-intersection? e.g. if a parametric curve looked like 

§10.2 #73-74:

This is just a semicircle.

This part is identical to #73, so you have a parametrization



To derive the parametrization in #73: