

Homework Sec 10.1 Parametric Equations

Name : _____

Six problems are given. Complete four or more of the (most challenging) problems.

Compare your curve sketch with Desmos, for example, by typing $(\tan^2 t, \sec t)$ or see

<https://www.desmos.com/calculator/aur1fhegdz>

1. Consider the curve $\begin{cases} x = 3 - 4t \\ y = 2 - 3t \end{cases}, -\infty < t < \infty.$

- Sketch the curve by plotting points. Indicate with an arrow the direction in which the curve is traced as t increases.
- Eliminate the parameter to find a Cartesian equation of the curve.

2. Consider the curve $\begin{cases} x = 1 - t^2 \\ y = t - 2 \end{cases}, -2 \leq t \leq 2.$

- Sketch the curve by plotting points. Indicate with an arrow the direction in which the curve is traced as t increases.
- Eliminate the parameter to find a Cartesian equation of the curve.

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3. Consider the curve $\begin{cases} x = t^2 \\ y = \sqrt{t^4 + 1} \end{cases}, 0 \leq t < \infty.$
- Sketch the curve by plotting points. Indicate with an arrow the direction in which the curve is traced as t increases.
 - Eliminate the parameter to find a Cartesian equation of the curve.
4. Consider the curve $\begin{cases} x = \sin \theta \\ y = \csc \theta \end{cases}, 0 < \theta < \frac{\pi}{2}.$
- Eliminate the parameter to find a Cartesian equation of the curve.
 - Sketch the curve and indicate with an arrow the direction in which the curve is traced as the parameter increases.

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5. Consider the curve $\begin{cases} x = e^t - 1 \\ y = e^{2t} \end{cases}, -\infty < t < \infty.$
- Eliminate the parameter to find a Cartesian equation of the curve.
 - Sketch the curve and indicate with an arrow the direction in which the curve is traced as the parameter increases.

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6. Consider the curve $\begin{cases} x = \tan^2 \theta \\ y = \sec \theta \end{cases}, -\frac{\pi}{2} < \theta < \frac{\pi}{2}$.
- Eliminate the parameter to find a Cartesian equation of the curve.
 - Sketch the curve and indicate with an arrow the direction in which the curve is traced as the parameter increases.