

Precalculus

Lesson 10.7: Plane Curves and Parametric Equations

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Think of a point moving in a plane through time. The x - and y - coordinates of the point will then be a function of time. So:

Let $x = f(t)$ and $y = g(t)$ where f and g are two functions whose common domain is some interval I . The collection of points defined by

$$(x, y) = (f(t), g(t))$$

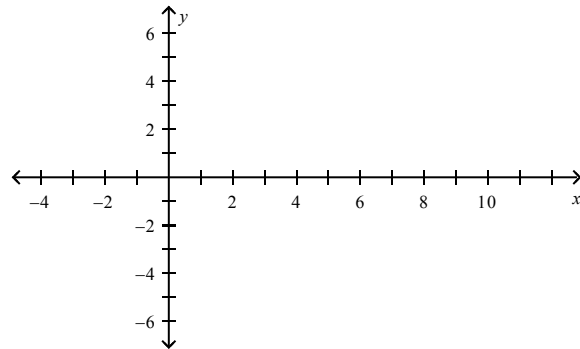
is called a **plane curve**. The equations

$$x = f(t) \quad y = g(t)$$

where t is in I are **parametric equations** for the curve. the variable t is called **parameter**.

Graphing a Curve Defined by Parametric Equations: Notice that for every value of t , we get a point on the curve.

$$x = 3t^2 \quad y = 2t \\ -2 \leq t \leq 2$$



Now find the rectangular equation for the parametric curve.

Eliminating the Parameter:

Often a curve given by parametric equations can also be represented by a single rectangular equation in x and y . The process of finding this equation is called eliminating the parameter.

Find the rectangular equation of the curve whose parametric equations are:

$$x = 4 \cos t, \text{ and } y = 3 \sin t \quad - 0 \leq t \leq 2\pi$$