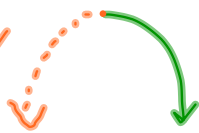


## Section 10.1b: Parametric Equations

Yesterday



bound the parameter  
 $0 \leq t \leq 3$

$$x = 5t$$

$$y = 45 - 5t^2$$

Express a parametric Equation with rectangular coordinates  $(x, y)$  → removing the parameter

1) Solve one Eq. for  $t$ .

$$x = 5t$$

$$\frac{x}{5} = t$$

2) sub in for  $t$  in other Eq.

$$y = 45 - 5t^2$$

$$y = 45 - 5\left(\frac{x}{5}\right)^2$$

$$y = 45 - 5\left(\frac{x^2}{25}\right) \Rightarrow y = 45 - \frac{x^2}{5}$$

$$\begin{aligned}x &= 3 \cos \theta & \cos \theta &= \frac{x}{3} \\y &= 3 \sin \theta & \sin \theta &= \frac{y}{3}\end{aligned}$$
$$\begin{aligned}\sin^2 \theta + \cos^2 \theta &= 1 \\ \left(\frac{y}{3}\right)^2 + \left(\frac{x}{3}\right)^2 &= 1\end{aligned}$$
$$9 \cdot \left(\frac{y^2}{9} + \frac{x^2}{9}\right) = 1 \cdot 9$$
$$y^2 + x^2 = 9$$