

Parametric Equations

Parametric Equations  $x = f(t)$  and  $y = g(t)$

$t$  is a parameter of the curve and

if the curve is on a closed interval then

$$x = \sqrt{t^4 + 9} \quad y = t^2 \quad t \geq 0$$

Circle  $x^2 + y^2 = a^2$

Ellipse  $x = a \cos t$   
 $y = b \sin t$   
 $0 \leq t \leq 2\pi$

$$x = \sin(2\pi(1-t))$$
$$y = \cos(2\pi(1-t)) \quad 0 \leq t \leq 1$$

$$x = 4 \sin t \quad y = 5 \cos t \quad 0 \leq t \leq \pi$$

$$x = \sec t \quad y = \tan t$$

$$x = \sec^2 t - 1 \quad y = \tan t$$

Parametrization for a line through a point (a,b) have a slope m

Line segments with endpoints

A wheel of radius  $a$  rolls along a horizontal straight line. The path traced by a point  $P$  on the wheel's circumference is called a cycloid. Parametric equation for a cycloid

