

Parametric Equations

10.1

Let x, y be functions of another variable say t (t or s are most common)

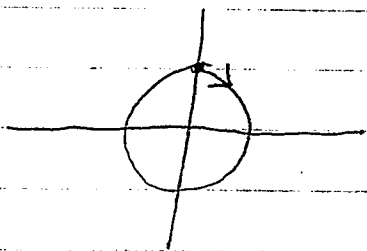
$$x = f(t) \quad y = g(t)$$

If t is a time variable, then these equations represent the trajectory of a particle in the plane: at time t the position / location of the particle is $(x(t), y(t))$.

Example $x(t) = \sin(t) \quad y(t) = \cos(t)$
 $x^2 + y^2 = 1$

at $t=0 \quad (x, y) = (0, 1)$

at $t=0.1 \quad x(t) > 0, y(t) < 1 \quad \therefore$ clockwise



Example $x(t) = 5 \sin(t) \quad y(t) = 2 \cos(t) \quad 0 \leq t < 2\pi$
 $\frac{x}{5} = \sin(t) \quad \frac{y}{2} = \cos(t)$
 $(\frac{x}{5})^2 + (\frac{y}{2})^2 = 1$

