

MA114 Summer 2018
Worksheet 23 – Calculus with Parametric Equations – 7/24/18

1. For the following parametric curves, find an equation for the tangent to the curve at the specified value of the parameter.
 - (a) $x = e^{\sqrt{t}}, y = t - \ln(t^2)$ at $t = 1$
 - (b) $x = \cos(\mu) + \sin(2\mu), y = \cos(\mu)$ at $\mu = \pi/2$.
2. For each parametric curve, find dy/dx :
 - (a) $x = e^{\sqrt{s}}, y = s + e^{-s}$
 - (b) $x = t^3 - 12t, y = t^2 - 1$
 - (c) $x = 4 \cos(\omega), y = \sin(2\omega)$
3. Find d^2y/dx^2 for the curve $x = 7 + t^2 + e^t, y = \cos(t) + \frac{1}{t}, 0 \leq t \leq \pi$.
4. Find the arc length of the following curves:
 - (a) $x = 1 + 3t^2, y = 4 + 2t^3, 0 \leq t \leq 1$.
 - (b) $x = 4 \cos(\theta), y = 4 \sin(\theta), 0 \leq \theta \leq 2\pi$.
 - (c) $x = 3v^2, y = 4v^3, 1 \leq v \leq 3$.