Math 172 | Quiz 9 | Name: _____

18 April 2016 | Show Appropriate Work | Point Values in $\boxed{\text{boxes}}$.

1. $\boxed{2}$ Find parametric equations, $x(t)$ and $y(t)$, for the line segment from $(1, 2)$ to $(4, 0)$. Include the domain of t.

$x(t) = 1 + 3t$

$y(t) = 2 - 2t$ for $0 \le t \le 1$

2. $\boxed{2}$ Find parametric equations, $x(t)$ and $y(t)$, for the circle with center $(3, -2)$ and radius 5. Include the domain of t.

$x(t) = 3 + 5\cos t$

$y(t) = -2 + 5\sin t$ $\quad 0 \le t \le 2\pi$

3. $\boxed{3}$ Find all points, (x, y) coordinates, where $c(t) = (t^2 + 6t, t^3 + 2t^2)$ has slope 2.

$$\frac{dy}{dx} = \frac{3t^2 + 4t}{2t + 6} = 2 \Rightarrow 3t^2 + 4t = 4t + 12$$

$$3t^2 - 12 = 0 \quad \text{so } t = \pm 2$$

$c(2) = (16, 16)$

$c(-2) = (-8, 0)$

4. $\boxed{3}$ Integrate.

$$\int (t+3)\ln t\, dt$$

$u = \ln t \qquad dv = (t+3)\,dt$

$du = \frac{1}{t}dt \qquad v = \left(\frac{t^2}{2} + 3t\right)$

$$= \left(\frac{t^2}{2} + 3t\right)\ln t - \int \left(\frac{t}{2} + 3\right) dt$$

$$= \left(\frac{t^2}{2} + 3t\right)\ln t - \left(\frac{t^2}{4} + 3t\right) + C$$