Math 3330 - Quiz 1

Name:_____

1. Convert the following equations from Cartesian to parametric.
   - $y^2 + y = x$
   - $y^2 - 4x = 2y + 1$
2. Convert the following equations from parametric to Cartesian.
   - $x = 2t - 1$, $y = t^2 + 2$
   - $x = t^3$, $y = t$
   - $x = \cos(3t)$, $y = \sin(3t)$
3. Graph the following equations given in parametric.
   - $x = 2t - 1$, $y = t^2 + 2$
   - $x = t^3$, $y = t$
   - $x = \cos(3t)$, $y = \sin(3t)$
   - $x = t\cos(t)$, $y = t\sin(t)$
4. Define the parametric equation:
   $$x = t^3 + 1,\ y = e^{t^4 - 16}$$
   Find the line tangent to the equation at the point $t = 2$.
5. Find the area under the curve given by the parametric equation from $t = 1$ to $t = 3$.
   $$x = t^3 + 1,\ y = e^{t^4 - 2}$$
6. Graph the equations:
   (a) $r = -2\cos(\theta)$
   (b) $r = \cos(2\theta)$
   (c) $r = 1 - \cos(\theta)$
7. Convert the equations from polar to rectagular.
   (a) $r = -2\cos(\theta)$
   (b) $r = \cos(2\theta)$ Hint recall the identity $\cos(2\theta) = \cos^2(\theta) - \cdots$

(c) $r = 1 - \cos(\theta)$

8. Find the equation of the tangent line to the function $r = 1 - \cos(2\theta)$ at the point where $\theta = \pi/4$.

9. Problems 7, 9, 23 from section 10.4