1. Find the rectangular coordinates of the point \((6, -\frac{\pi}{4})\) given in polar coordinates.

\[
x = r \cos \theta = 6 \cos \left(-\frac{\pi}{4}\right) = 6 \left(\frac{\sqrt{2}}{2}\right) = 3\sqrt{2}
\]
\[
y = r \sin \theta = 6 \sin \left(-\frac{\pi}{4}\right) = 6 \left(-\frac{\sqrt{2}}{2}\right) = -3\sqrt{2}
\]

So point is \((3\sqrt{2}, -3\sqrt{2})\)

2. Find the slope of the tangent line to the parametric curve \(x = \frac{t}{2}, y = t^2 + 1\) at \(t = 1\).

\[
\frac{dy}{dt} = 2t \quad \frac{dx}{dt} = \frac{1}{2}
\]

\[
\text{slope} = \frac{dy}{dx} = \frac{\frac{dy}{dt}}{\frac{dx}{dt}} = \frac{2t}{\frac{1}{2} \cdot 2} = 4t \quad \bigg|_{t=1} = -4
\]

3. Sketch the curve for the parametric equations \(x = 3t - 4\) and \(y = 6t + 2\). Make sure to indicate the direction of increasing \(t\) on your graph.

\[
\begin{array}{c|c|c}
t & x & y \\
\hline
-1 & -7 & -4 \\
0 & -4 & 2 \\
1 & -1 & 8 \\
2 & 2 & 14 \\
\end{array}
\]

\[
0 \Rightarrow x + y = 3t \Rightarrow t = \frac{x + y}{3}
\]

\[
y = 6 \left(\frac{x + y}{3}\right) + 2
\]

\[
y = 2x + 8 + 2 \Rightarrow 2x + 10 = y
\]