Each problem is worth 5 points. Clear and complete justification is required for full credit.

1. Write \( \int_R f \, dA \) as an iterated integral for the region \( R \) shown below:

\[
\begin{align*}
1 & \leq r \leq 3 \\
0 & \leq \theta \leq \frac{\pi}{2}
\end{align*}
\]

\[
\int_{\frac{\pi}{2}}^{\pi} \int_{1}^{3} f \, r \, dr \, d\theta
\]

2. Carefully sketch the region of integration represented by the integral \( \int_{\pi/4}^{5\pi/4} \int_{\pi/4}^{2} 4r^3 \, dr \, d\theta \).

It is a part of a circle with radius of 2 centered at (0,0) going from \( \frac{\pi}{4} \) to \( \frac{5\pi}{4} \). So it is a semicircle.

Excellent!