6 April

1. (a) $\langle -3, e, 3 \rangle$.
   (b) $\sqrt{18 + e^2}$.

2. Saddles at $(0, 0)$ and $(-2, -6)$.

3. (a) 18.
   (b) Not covered.

4. $\int_0^{\sqrt{3}} \int_0^{x^2} f(x, y)\, dy\ dx + \int_{\sqrt{3}}^{3} \int_0^{3} f(x, y)\ \ dy\ dx$.

5. $\frac{81\pi}{2}$.