1. State the Fundamental Theorem of Calculus.

If $f$ is continuous on $[a, b]$ and $G$ is an antiderivative for $f$, then

$$\int_a^b f(x) \, dx = G(b) - G(a).$$

2. Find the area of the region bounded by $y = x^2$ and $y = 4 - x^2$.

Area = \( \int_{-\sqrt{2}}^{\sqrt{2}} (4 - x^2) - x^2 \, dx \)

\[= \int_{-\sqrt{2}}^{\sqrt{2}} 4 - 2x^2 \, dx\]

\[= \left[ 4x - \frac{2}{3}x^3 \right]_{-\sqrt{2}}^{\sqrt{2}}\]

\[= 16\sqrt{2}/3.\]