7. a. The graph of a function $f$ is given below. Would you expect $\int_a^b f \, dx$ to be positive, negative, or 0? Why?

\[ \int_a^b f \, dx \]

The graph should be positive because there is more area above the x-axis than below it.

b. Evaluate $\int_2^0 \sqrt{x^4 + \sin \sqrt{x}} \, dx = 0$ because the upper and lower limits of integration are equal.

c. Evaluate $\frac{d}{dx} \int x \frac{1}{s + a} \, ds = \Delta - \frac{1}{\sqrt{a^2 + x}} \cdot (2x) = \frac{-2x}{x^2 + a}$

d. Use geometry to evaluate $\int_0^a \sqrt{a^2 - x^2} \, dx$

\[ \frac{1}{4} \cdot \pi \cdot a^2 = \frac{\pi a^2}{4} \]