Problem 1. Suppose that we have a function $f(x)$ whose values are given by the following table.

x	0.0	0.2	0.4	0.6	0.8	1.0
$f(x)$	1.0	0.9	0.7	0.9	1.0	1.2

Use Simpson's Rule to approximate the value of $\int_0^{0.8} f(x)dx$ with $n = 2$.

$$\frac{1}{3}\Delta x \left(f(0.0) + 4f(0.4) + f(0.8) \right)$$

$$= \frac{1}{3} \, 0.4 \left(1.0 + 4 \cdot 0.7 + 1.0 \right) = \boxed{0.64}$$

Problem 2. Determine the value of the integral if it exists or else write DIVERGENT.

$$\int_0^1 \frac{1}{\sqrt{x}} dx$$

$$= \lim_{t \to 0+} \int_t^1 \frac{1}{\sqrt{x}} dx = \lim_{t \to 0+} 2\sqrt{x} \Big|_t^1$$

$$= \lim_{t \to 0+} \left(2 - \sqrt{t} \right) = 2 - \sqrt{0} = \boxed{2}$$