Quiz 11

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Problem 1:

\[
\int_{1}^{\infty} \frac{4}{x^2} \, dx = \lim_{b \to \infty} \int_{1}^{b} \frac{4}{x^2} \, dx
\]

\[
= \lim_{b \to \infty} \left[ -4 \frac{1}{x} \right]_{1}^{b}
\]

\[
= -4 \lim_{b \to \infty} \left( \frac{1}{b} - \frac{1}{1} \right)
\]

\[
= -4(0 - 1)
\]

\[
= 4
\]

Problem 2:

\[
T_n = \frac{\Delta x}{2} [f(x_0) + 2f(x_1) + \ldots + 2f(x_{n-1}) + f(x_n)]
\]

n=3 so our partition is \{1,2,3,4\}

\[
\Delta x = \frac{4 - 1}{3} = 1
\]

\[
f(x) = x^2
\]
\[\int_1^4 x^2 \, dx \approx \frac{1}{2}[f(1) + 2f(2) + 2f(3) + f(4)]\]

\[= \frac{1}{2}[1^2 + 2(2)^2 + 2(3)^2 + 4^2]\]

\[= \frac{1}{2}[1 + 8 + 18 + 16]\]

\[= \frac{43}{2}\]