Monte Carlo Integration of h on $[a, b]$:

$$\int_a^b h(x)\,dx = \int_a^b \frac{h(x)}{f(x)}\, f(x)\,dx$$

$$= \int \frac{h(x)}{f(x)}\, I\{a \le x \le b\}\, f(x)\,dx$$

$$= E_f\left(\frac{h(X)}{f(X)}\, I\{a \le X \le b\} \right)$$

$$\approx \frac{1}{B} \sum_{i=1}^{B} \frac{h(x_i)}{f(x_i)}\, I\{a \le x_i \le b\}$$

where $x_1, x_2, \ldots, x_B$ are iid draws from the distribution having density f.