

1. (5 pts) Use integration by parts to find

$$\int \arcsin x \, dx$$

2. (6 pts) Obtain the reduction formula

$$\int (\ln x)^n \, dx = x(\ln x)^n - n \int (\ln x)^{n-1} \, dx$$

and use it to compute the exact value of $\int_1^e (\ln x)^3 \, dx$.