1. (10 total points) Evaluate the following indefinite integrals.

   (a) (5 points) $\int x^2 \ln x \, dx$

   (b) (5 points) $\int \tan^3(x) \sec(x) \, dx$

2. (10 total points)　Evaluate the following definite integrals.

(a) (5 points) $\displaystyle\int_0^{\ln 2} \frac{7e^{2t}}{e^{2t}+3e^t+2}\,dt$

(b) (5 points) $\displaystyle\int_0^{1/2} \sqrt{2x-x^2}\,dx$