1. (10 pts) Evaluate the integral using integration by parts.

(a) $\displaystyle\int_0^{\pi/2} x \sin x \, dx$

(b) $\displaystyle\int x^2 e^x \, dx$

2. (10 pts) Evaluate the trigonometric integral.

(a) $\displaystyle\int \cos^2 x\, dx$

(b) $\displaystyle\int_0^{\pi/2} \sin^3 x\, dx$