

## PHY 341 HW Ch.1a

Do problems 1.2, 1.4, 1.5, 1.7; plus the following:

### q1-1

The wave function  $\psi(x, t)$  is defined for  $0 \leq x \leq L$  as

$$\psi(x, t) = A\sqrt{x(L-x)} \exp(i\omega t).$$

- (a) Sketch the wave function and probability. Where is the maximum?
- (b) Determine the normalization constant  $A$ . What is the dimension of  $A$ ?  $\psi$ ?
- (c) Calculate the expectation values  $\langle x \rangle$  and  $\langle x^2 \rangle$ .
- (d) Find the uncertainty  $\Delta x = \sqrt{\langle x^2 \rangle - \langle x \rangle^2}$ .