6 **Show your work**
County tax authorities have extensive records of residential property, and it is therefore it is possible to take a simple random sample of **single-family residences** within a county. For King County and for Chelan County, this population of **single-family residences** is large. For convenience, in this question, we refer to **single-family residences** as **homes**.

(a) (6 points: 2 each part). To conduct a housing survey, a simple random sample of 400 **homes** is taken from the Chelan County records. Various measurements are made, but one item of the survey concerns the total exterior glass window area of each home, measured in square feet (sq.ft). For the 400 sampled homes, the average window area was 200.0 sq.ft. and the SD was 150 sq.ft.

(i) What is the estimated standard error (SE) of the average window area for the sample of 400 homes.

(ii) Find a 95% confidence interval for the average window area of homes in Chelan County.

(iii) Explain briefly what this 95% confidence interval means.

(b) (6 points; 3 each part) A similar survey is done in King County. Here 256 homes are sampled. For this sample the average window area is 218.75 sq ft, and the SD is 160 sq.ft.

(i) What is the estimated standard error (SE) of the average window area for this sample of 256 homes? **Also:** What is the estimated standard error (SE) for the difference between this sample average and the sample average of (a)?

(ii) Find the significance level (P-value) for testing the null hypothesis that the average window area is the same for homes in Chelan County and in King County. Would you reject this hypothesis?