Mini Quiz Solutions

Problem 1:

1a: Pie chart or dot plot

1b: small multiples of boxplots, or scatterplot

2: less, since average is larger than median

Problem 2:   
selection bias, simple random sample (possibly also non-response bias), and nonresponse bias

Problem 3:  
Use complement rule: 1-P(5 tails)=1-(1/2)^5  
Use Bayes rule: P(admit | high GPA) = P(high GPA | admit) \* P(admit) / P(high GPPA)

Problem 4:   
1: equal

2a: false (taxable income is skewed)

2b: true (the percentage follows the normal curve b/c of central limit theorem)

Problem 5:   
1a: No, association is not causation.

1b: still no, there could be other confounders such as parental involvement

2: May well be the regression effect since students requesting tutoring may be below average

3: false, the residual may be small because the point is influential

Problem 6:

1a: false, home prices do not follow the normal curve, also the question confuses SE with SD

1b: false, the average price of all homes is a fixed number, there are no chances involved

2a: yes, because of the central limit theorem

2b: sample size needs to be larger by a factor of (5400/2000)^2=7.3

3: No, the data are not a random sample

Problem 7:   
1a: true  1b:false (the null is true or not, no chances involved)  1c: true   1d: true

2a: z-test   2b: t-test  2c: paired-difference test

Problem 8:   
1:iii  2:ii  3: iii