Name: _____

Directions: MAKE SURE TO COPY YOUR ANSWERS TO A SEPARATE SHEET FOR SENDING ME AN ELECTRONIC COPY LATER.

1. (20) The courtroom analogy used in our text describing the philosophy underlying significance testing is _____

2. (15) Consider the beta distribution family, Sec. 6.6.5. It has two parameters, α and β. In fitting such a model to our data, we would come up with estimates of these two parameters, $\widehat{\alpha}$ and $\widehat{\beta}$. Fill in the blank with a term from our course: The standard deviations of $\widehat{\alpha}$ and $\widehat{\beta}$ are called their _____

3. (15) Suppose we wish to construct an (approximate) 80% confidence interval. What number should we use instead of 1.96? Your answer must consist of an R call.

4. (20) For various distribution families, R provides the functions 'd', 'p', 'q' and 'r'. Give nonsimulation R code that computes (11.9), using an appropriate one of these functions. For full credit, your code should not use loops.

5. Let W denote the weight of some kind of item. Unknown to us, in the populaiton $f_W(t) = 2(1-t)$ for t in (0,1), 0 elsewhere.

(a) (15) Find the population value $P(W > 0.2)$.

(b) (15) We take a random sample $W_1, ..., W_{100}$, and calculate $\overline{W} = \sum_{i=1}^{n} W_i \ / \ 100$. Find the exact value of $Var(\overline{W})$. An expression of the form $a - b^2$ MUST appear in your electronic answer.

Solutions:

1. innocent until proven guilty

2. standard errors

3

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qnorm(0.90)
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4

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1 - pbinom(7,10,0.5)
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5.a

$$\int_{0.2}^{1} 2(1-t)\ dt = 0.64$$

5.b $Var(\overline{W}) = \sigma^2/100$. So compute $EW = 1/3$ and $E(W^2) = 1/6$. Our answer is then $(1/6 - (1/3)^2)/100$.