Project Chapter 3[1]

We shall later learn in this course that the optimal 95% confidence interval for the unknown proportion p is

$$\widehat{p} \pm \mathrm{MOE}^*$$

where the margin of error MOE^* is given by the formula

$$\mathrm{MOE}^* = \frac{z^* \sqrt{p(1-p)}}{\sqrt{n}}$$

with $z^* = 1.96$.

Chapter 3 says that an approximate 95% confidence interval for the unknown proportion p is

$$\widehat{p} \pm \mathrm{MOE}$$

where the margin of error MOE is given by the formula

$$\mathrm{MOE} = \frac{1}{\sqrt{n}}.$$

Problem 1. Which of the two margins of error – MOE^* or MOE – is larger?

Problem 2. At what point(s) $p \in [0, 1]$ is the distance between MOE^* or MOE minimal?

Problem 3. At what point(s) $p \in [0, 1]$ is the distance between MOE^* or MOE maximal?

[1]The project is optional. **It will not be marked.** If you do it, place your solutions into Dropbox on OWL and I will look at them. Since the project won't be marked, why would you want to do it? Benefits:

1. It will deepen your knowledge.
2. Just in case we need some evidence of your hard work at the very end of this course, we shall revisit your Dropbox submissions.