ST2005: Applied Probability II
Lab Assignment 2

As we saw in the lecture, a $100(1-\alpha)\%$ confidence interval for θ in

$$f(x) = \frac{2}{\theta^2}(\theta - x) \quad , \quad 0 < x < \theta$$

would be in form of

$$\left(\frac{x}{1-\sqrt{\frac{\alpha}{2}}}, \frac{x}{1-\sqrt{1-\frac{\alpha}{2}}} \right)$$

where x is a single sample observation from random variable X.

Q1. For $\theta = sum\ of\ the\ first\ two\ right\ digits\ of\ you\ student\ number$ and $\alpha = 0.05$, using 1 sample from the above distribution, generate a 95% CI for θ.

Then using 10000 iterations, show that for around 95% of you iterations the calculated CIs would contain the actual θ.

Hint 1.
You would require to install the package "triangle" to generate the samples from the above right-angled triangle distribution. See what are a, b and c in this package.

Hint 2.
The triangle package would not work when $a = c = 0$!!! You would therefore need to choose a small number close to 0 instead of actual 0.