(2.5 points) 1. Let X be the number of successes in $n = 400$ independent trials where the probability of success on each trial is $p = 0.6$. Find

(a) $P(232 \le X \le 250)$ by using the **normal approximation** to the binomial.
normalcdf$\left(231.5, 250.5, 240, \sqrt{(240 * 0.4)}\right) =$ **0.6652352833.**

(b) $P(232 \le X \le 250)$ by using the **binomcdf function** on the TI.
binomcdf(400,0.6,250) – binomcdf(400,0.6,231) = **0.6655823078.**

(2.5 points) 2. The heights of trees are measured. If the **population mean** is 2.24 m with a **population standard deviation** of 0.25 m, find the probability that

(a) **one** tree measured at random has a height under 2.19 m. (Normal distribution.)
normalcdf(0, 2.19, 2.24, 0.25) = **0.4207403122.**

(b) 100 trees in a random sample have a **sample mean** under 2.19 m.
normalcdf(0, 2.19, 2.24, 0.025) = **0.022750062.**

(1.25 points) 3. $\overline{x}$ is 40 and the margin of error, E, is 5.75. Find the confidence interval.

$\overline{x} - E$ to $\overline{x} + E$ 40 – 5.75 to 40 + 5.75

The confidence interval is from 34.25 to 45.75.

(1.25 points) 4. There arre 17 successes in 40 trials. Find the margin of error for a 99% confidence interval for population proportion, p.

$\hat{p} = 17/40$, $\hat{q} = 23/40$, $\alpha = 0.01$, $\alpha/2 = 0.005$.

$$E = z(0.005)\sqrt{\frac{\frac{17}{40}\cdot\frac{23}{40}}{40}} = \text{invNorm}(0.995)\sqrt{17 \cdot 23/40^\wedge 3} = 0.2013332347.$$

(2.5 points) 5. Find (a) z(0.08) using a TI function. invNorm(0.92) = **1.4050715661.**

(b) t(0.08, 21) using the TI solver or InvT. invT(0.92, 21) = **1.456662632.**

Or, solve $0 = 0.080 - \text{tcdf}(X, 10^\wedge 99, 21)$

(10 points, total.)