6.7: Chapter 6 Formulas

Uniform Distribution

$f(x) = \frac{1}{b-a}$, for $a \le x \le b$

- $P(X \ge x) = \mathrm{P}(X > x) = \left(\frac{1}{b-a}\right) \cdot (b-x)$
- $\mathrm{P}(X \le x) = \mathrm{P}(X < x) = \left(\frac{1}{b-a}\right) \cdot (x-a)$
- $P(x_1 \le X \le x_2) = \mathrm{P}(x_1 < X < x_2) = \left(\frac{1}{b-a}\right) \cdot (x_2 - x_1)$

Exponential Distribution

$f(x) = \frac{1}{\mu} e^{\left(-\frac{x}{\mu}\right)}$, for $x \ge 0$

- $\mathrm{P}(X \ge x) = \mathrm{P}(X > x) = \mathrm{e}^{-x/\mu}$
- $\mathrm{P}(X \le x) = \mathrm{P}(X < x) = 1 - \mathrm{e}^{-x/\mu}$
- $\mathrm{P}(x_1 \le X \le x_2) = \mathrm{P}(x_1 < X < x_2) = e^{\left(-\frac{x_1}{\mu}\right)} - e^{\left(-\frac{x_2}{\mu}\right)}$

Standard Normal Distribution

$\mu = 0, \sigma = 1$

z-score: $z = \frac{x-\mu}{\sigma}$

$x = z\sigma + \mu$

Central Limit Theorem

Z-score: $z = \frac{\bar{x}-\mu}{\left(\frac{\sigma}{\sqrt{n}}\right)}$

Normal Distribution Probabilities:

P(X ≤ x) = P(X < x)

Excel: =NORM.DIST(x,μ,σ,true)

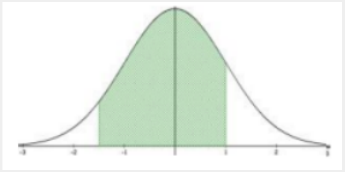
TI-84: normalcdf(-1E99,x,μ,σ)

P(X ≥ x) = P(X > x)

Excel: = 1–NORM.DIST(x,μ,σ,true)

TI-84: normalcdf(x,1E99,μ,σ)

P(x_1 ≤ X ≤ x_2) = P(x_1 < X < x_2) =



Excel: =NORM.DIST(x2,μ,σ,true)-NORM.DIST(x1,μ,σ,true)

TI-84: normalcdf(x1,x2,μ,σ)

Percentiles for Normal Distribution:

P(X ≤ x) = P(X < x)

Excel: =NORM.INV(area,μ,σ)

TI-84: invNorm(area,μ,σ)

P(X ≥ x) = P(X > x)

Excel: =NORM.INV(1–area,μ,σ)

TI-84: invNorm(1–area,μ,σ)

P(x_1 ≤ X ≤ x_2) = P(x_1 < X < x_2) =

Excel: x_1 =NORM.INV((1–area)/2,μ,σ)

x_2 =NORM.INV(1–((1–area)/2),μ,σ)

TI-84: x_1 = invNorm((1–area)/2,μ,σ)

x_2 =invNorm(1–((1–area)/2),μ,σ)