# Fitting Continuous Distributions

## Continuous Distributions

### The Continuous Uniform Distribution

Unlike for discrete variables, $P(X = x) = 0$ for any continuous distribution, therefore we must calculate $P(a < X < b)$ instead.
We may need to use the continuity correction
To calculate the necessary probabilities, we can use the formula

$$(x_1 - x_2) / (b - a)$$

### The Normal Distribution

As with the Continuous Uniform Distribution, $P(X = x) = 0$ for any continuous distribution, therefore we must calculate $P(a < X < b)$ instead.
We may need to use the continuity correction.
Here, we can use the Normal CD function on the calculator.

### The Exponential Distribution

As with the Continuous Uniform and Normal Distributions, $P(X = x) = 0$ when using the Exponential Distribution, therefore we must calculate $P(a < X < b)$ instead.
We may need to use the continuity correction
We can use the Exponential formula $P(X \leq x) = 1 - e^{-\lambda x}$

REMEMBER: $P(a \leq X \leq b) = P(X \leq b) - P(X \leq a)$

$= (1 - e^{-\lambda b}) - (1 - e^{-\lambda a})$

$= e^{-\lambda a} - e^{-\lambda b}$