

Normal Distribution, the NORM.DIST function

Example

A bread producing company produces whole wheat loaves of bread in its factory.

It observes that on average every day 85 loaves of bread get discarded on account of being defective.

The standard deviation of number of defectives is 9 loaves.

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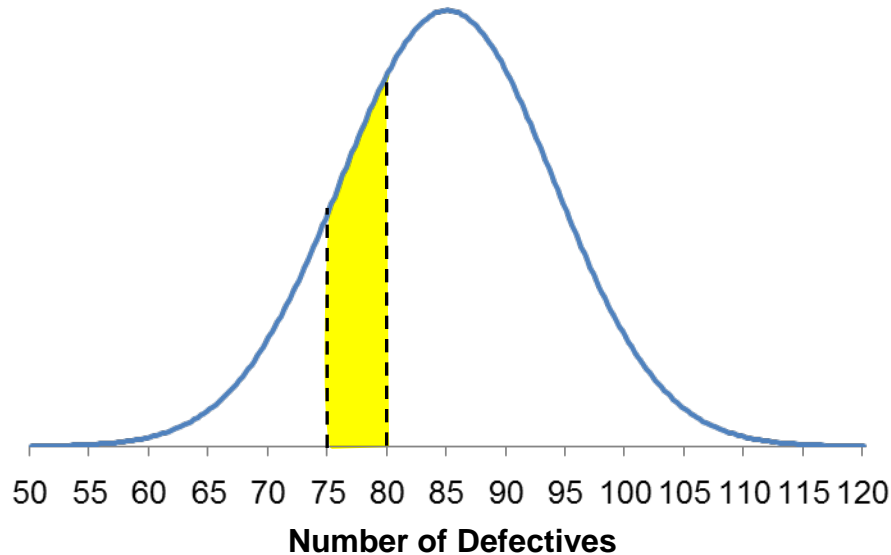
It observes that on average every day 85 loaves of bread get discarded on account of being defective.

The standard deviation of number of defectives is 9 loaves.

What is the probability that the number of defective loaves produced is between 75 and 80?

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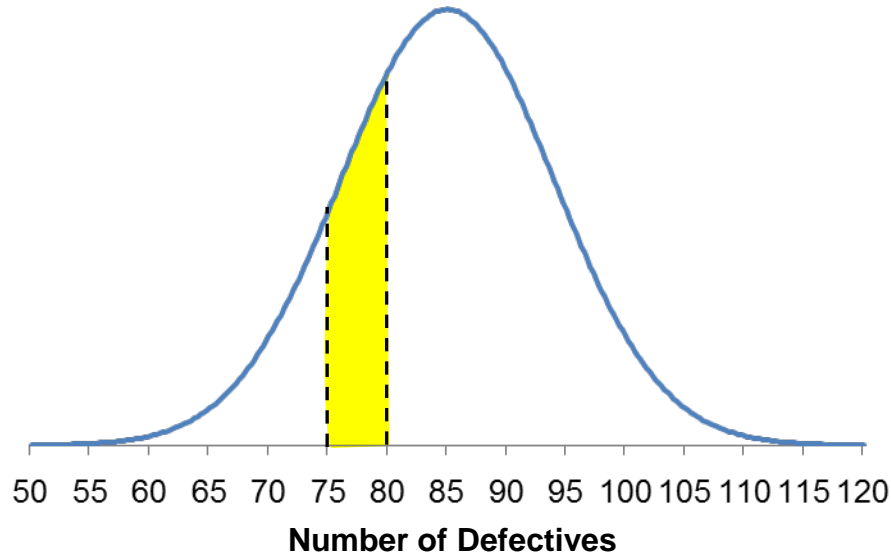
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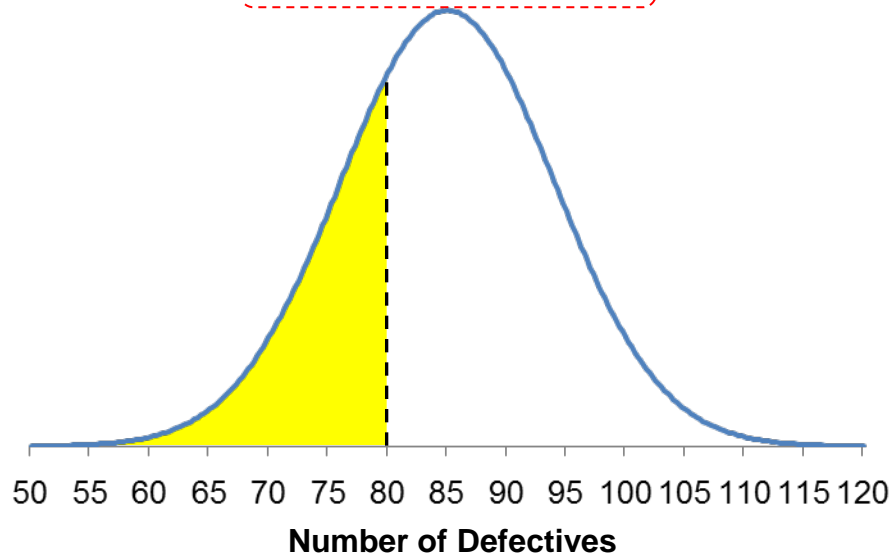
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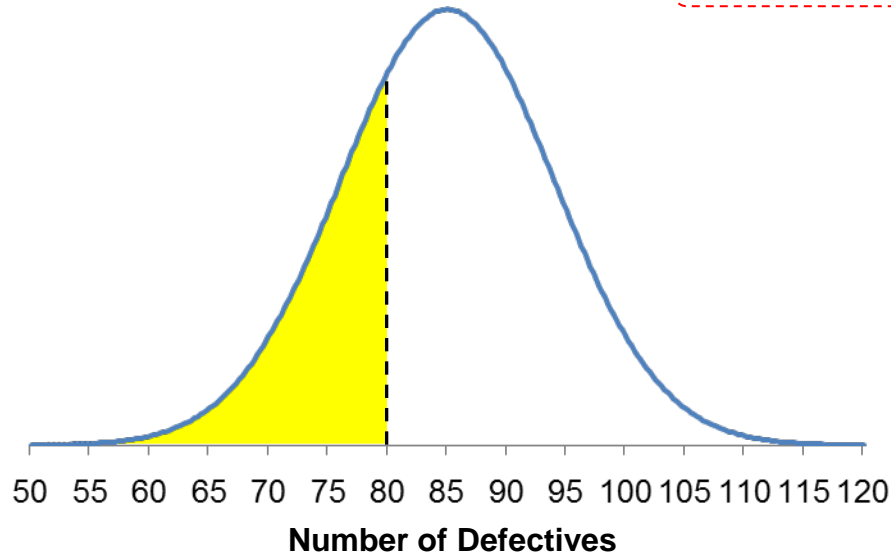
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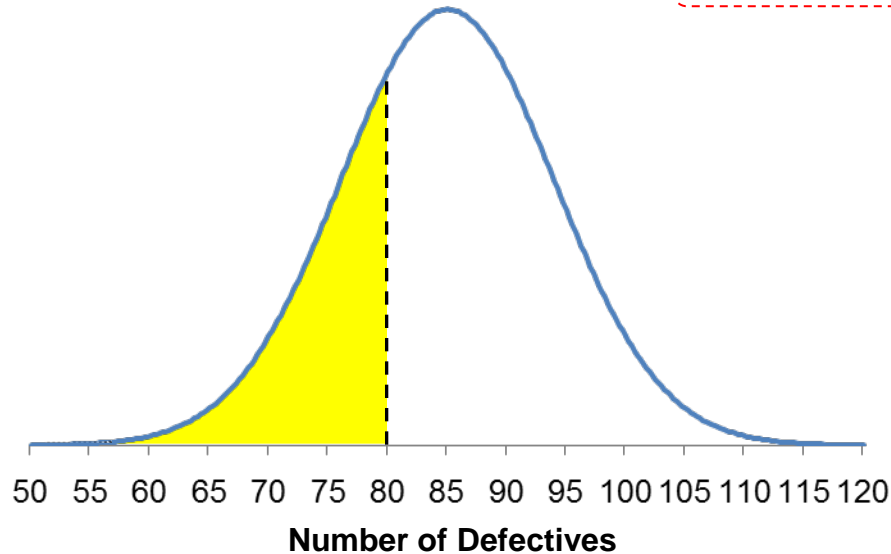
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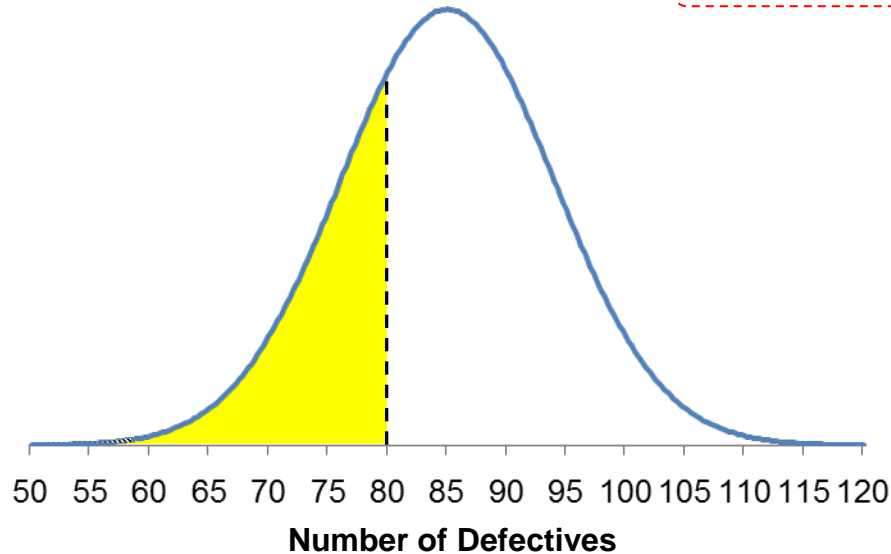
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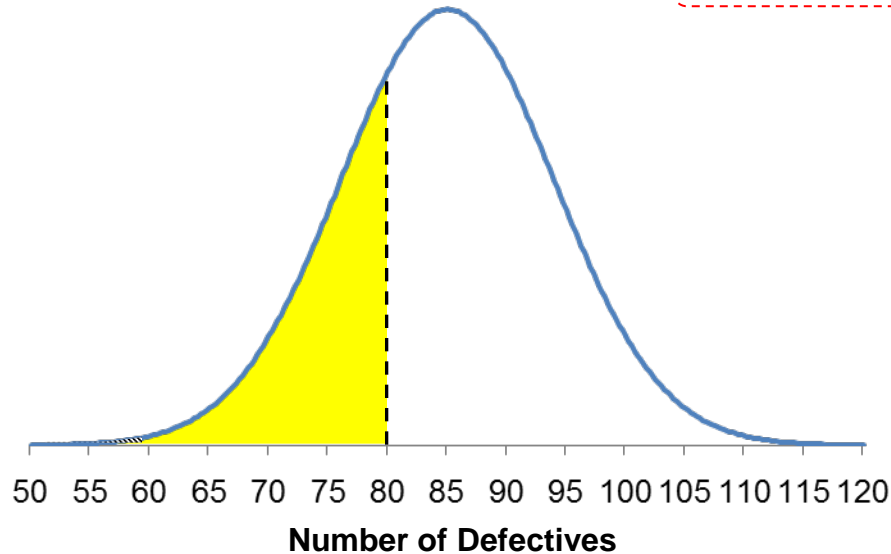
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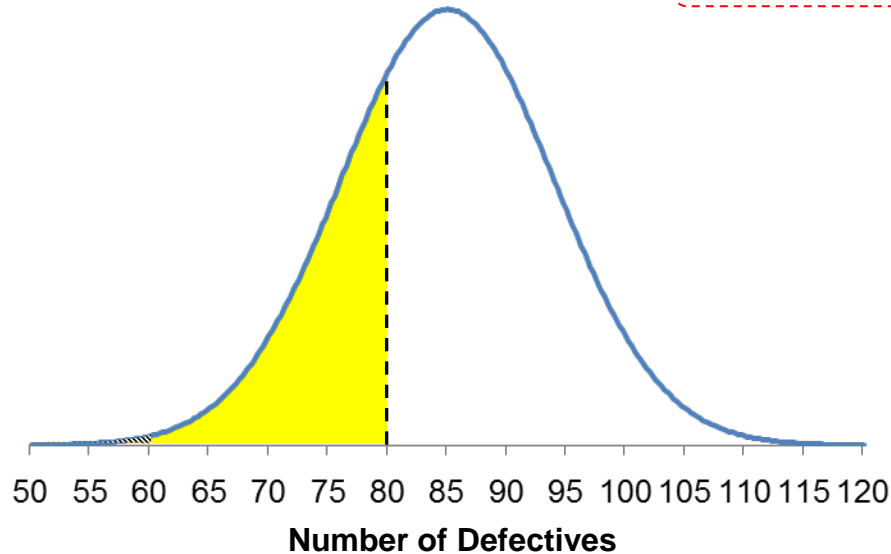
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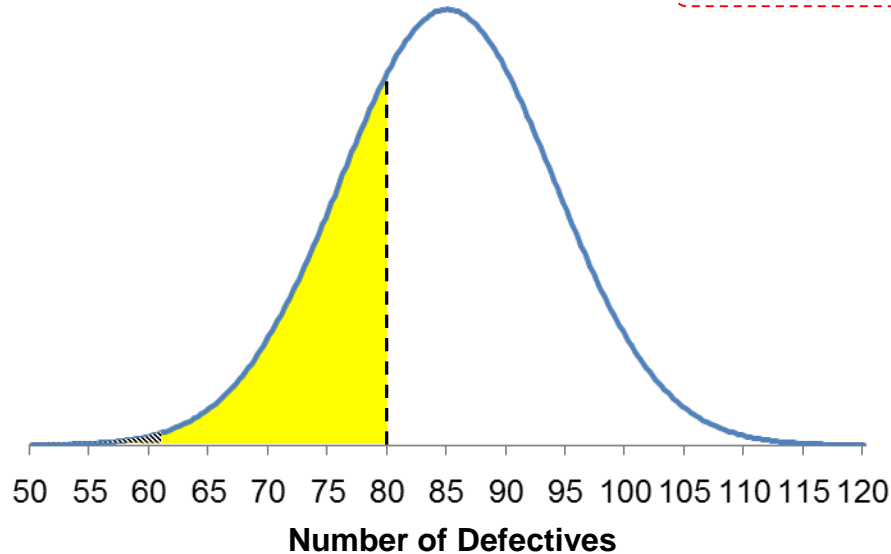
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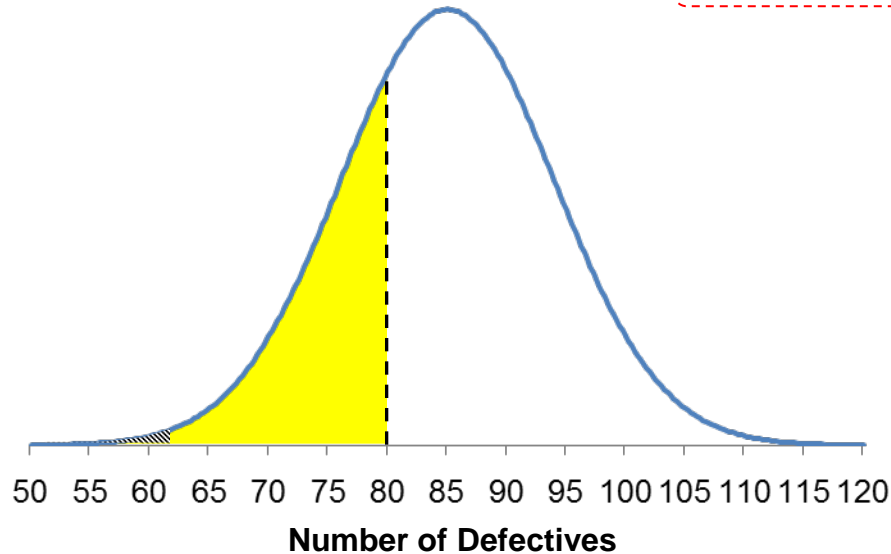
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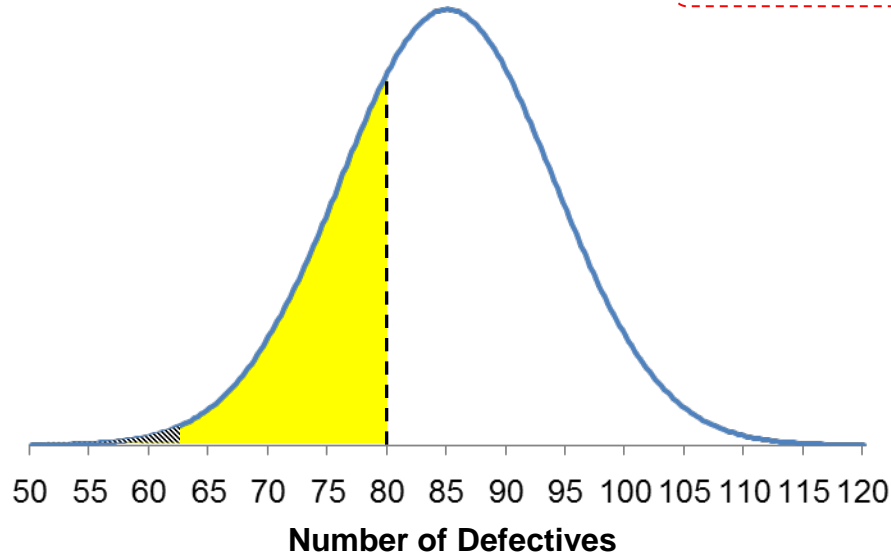
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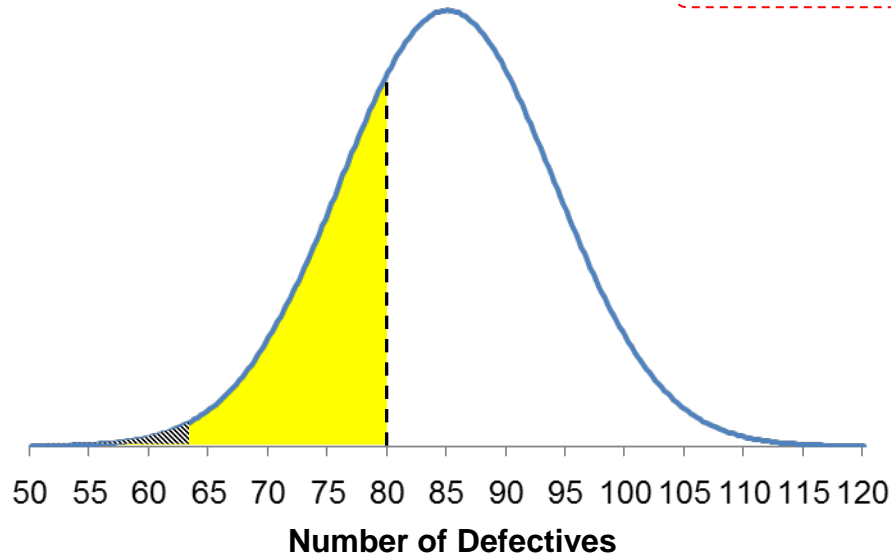
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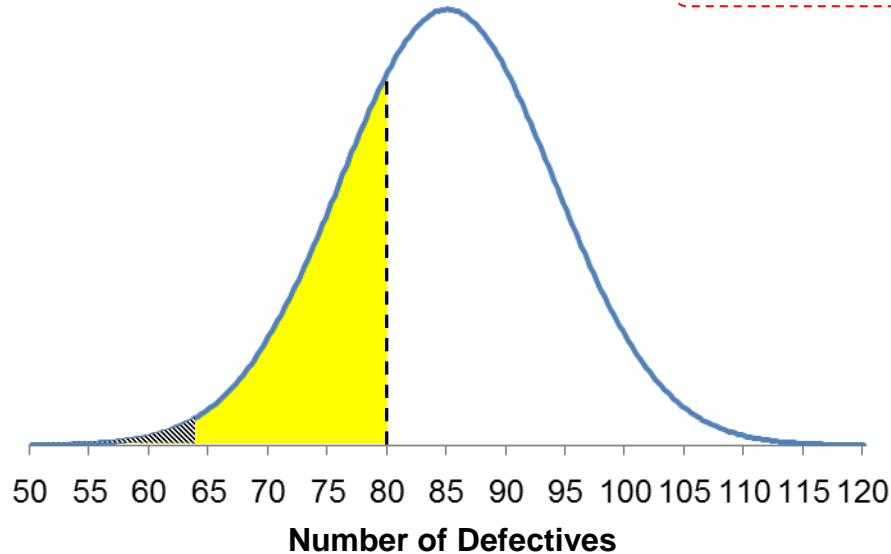
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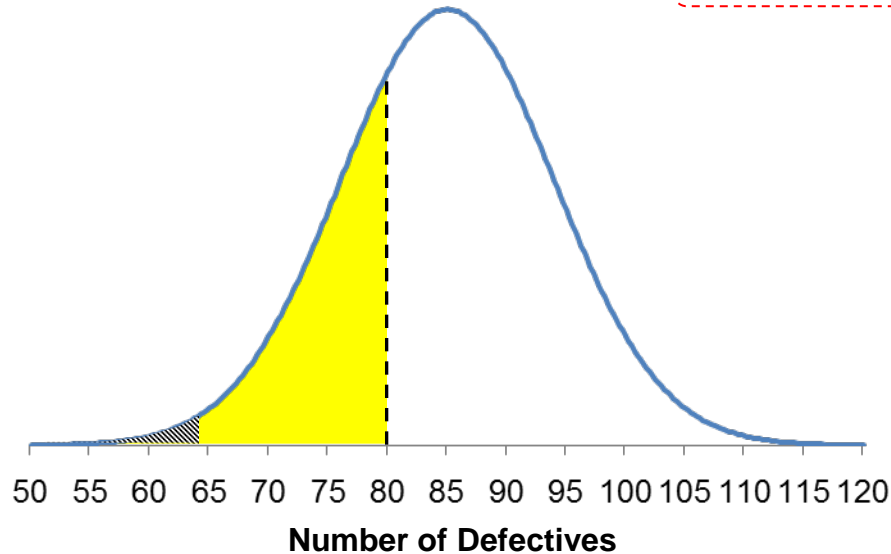
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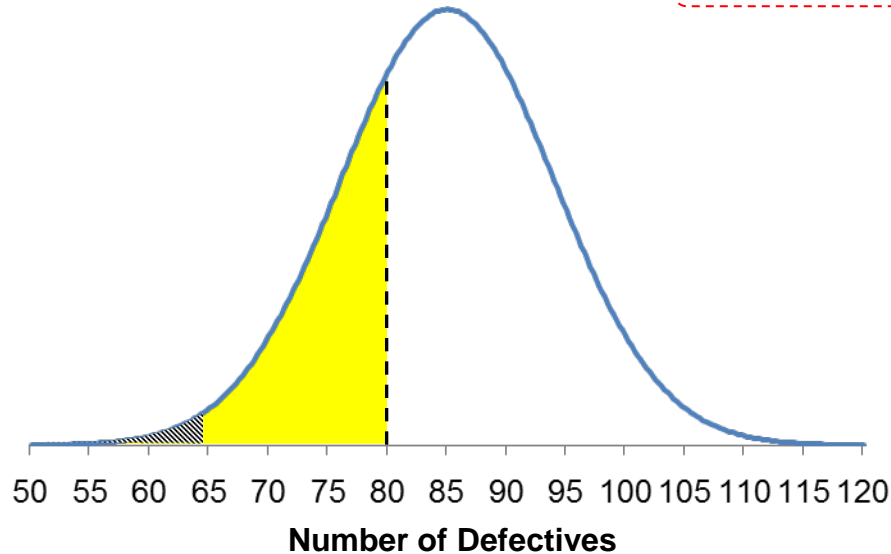
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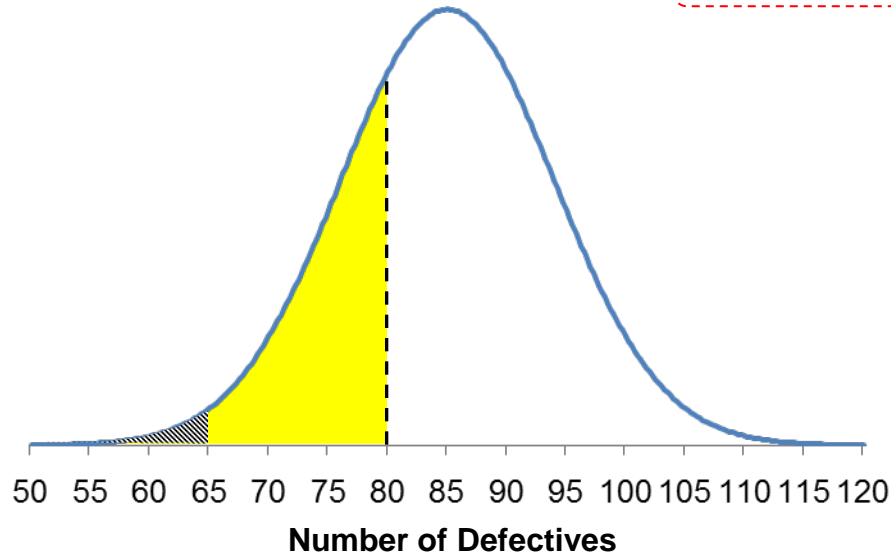
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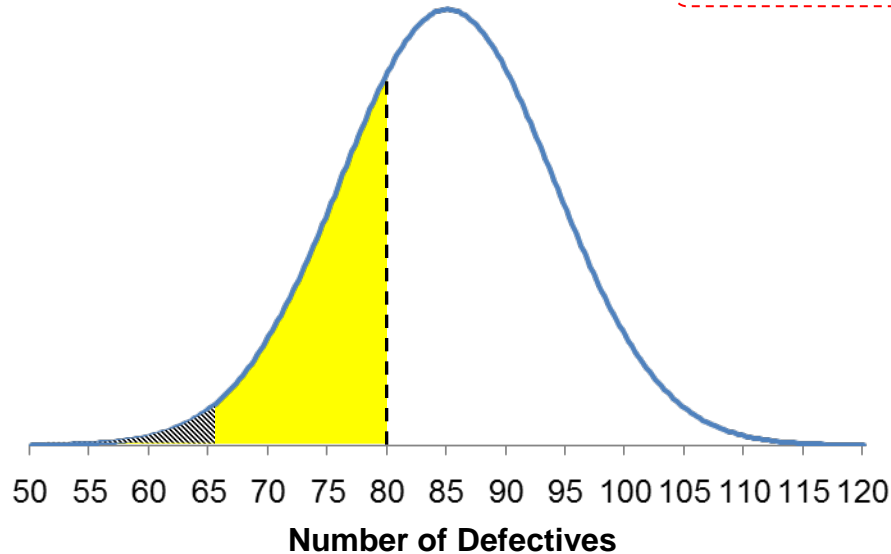
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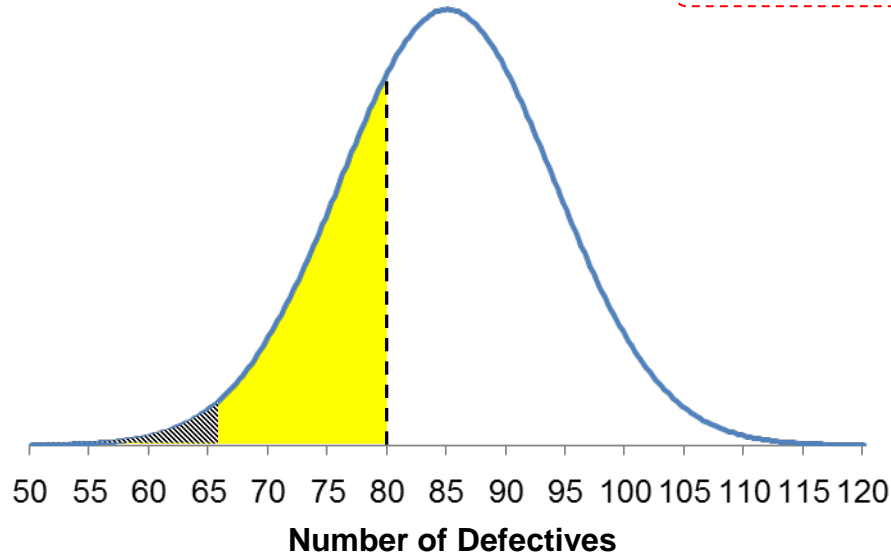
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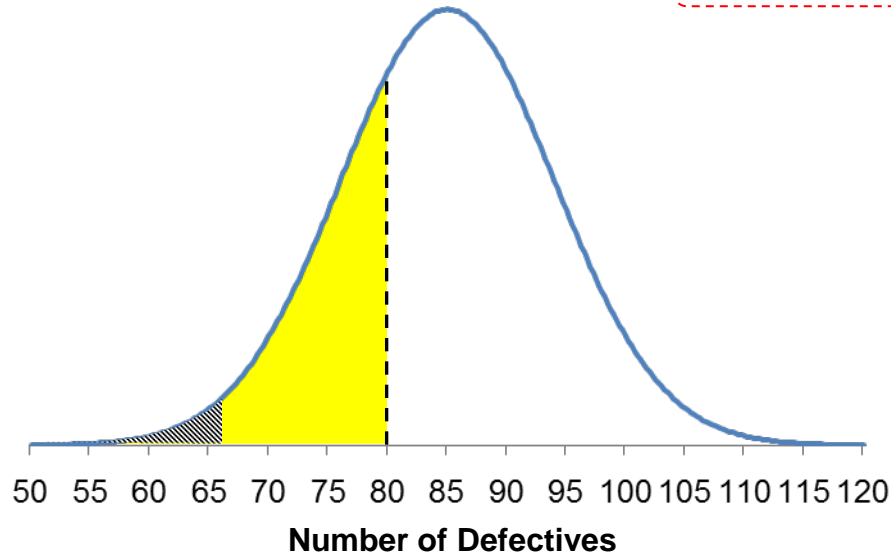
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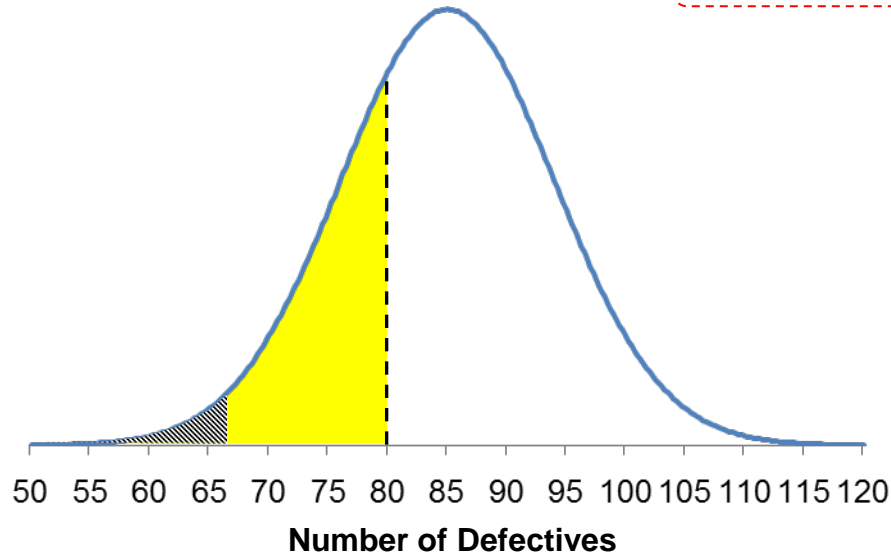
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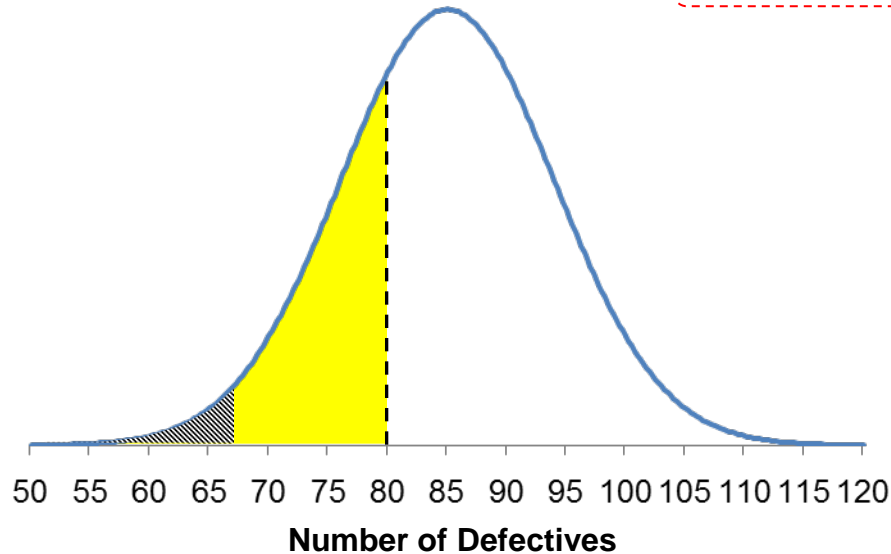
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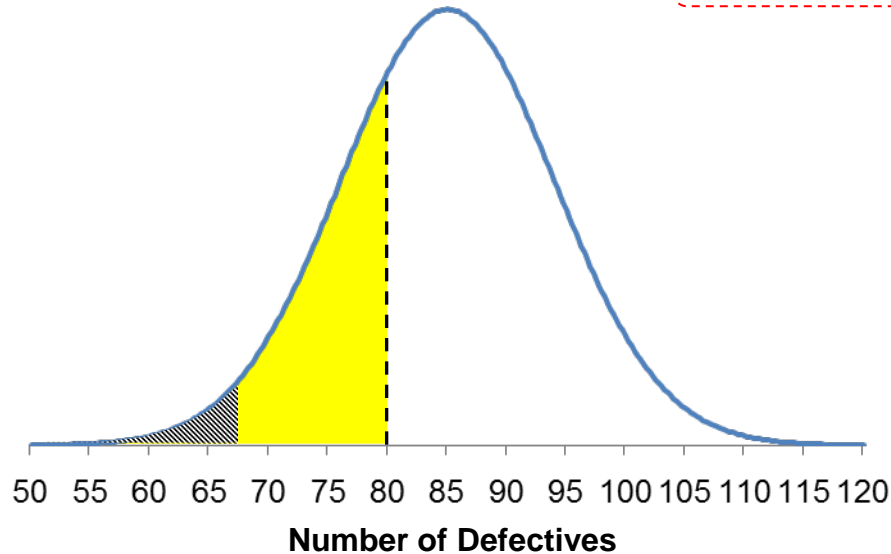
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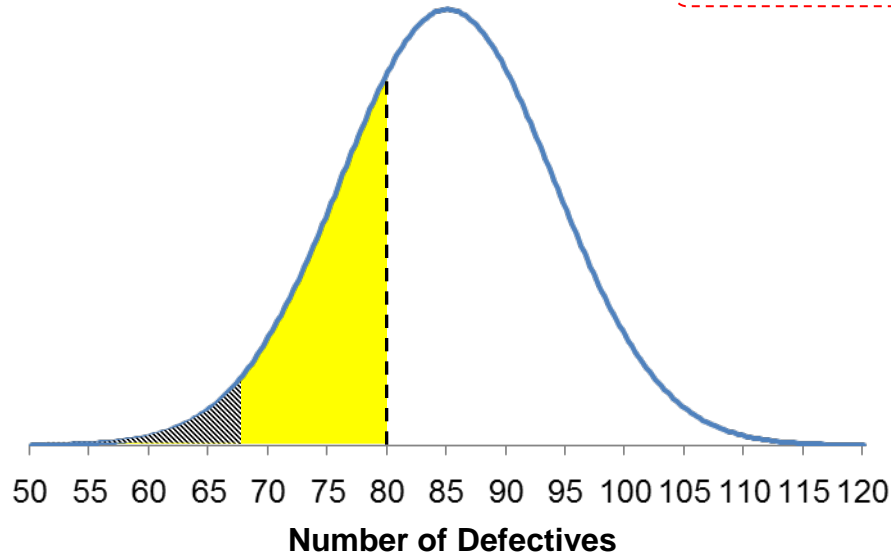
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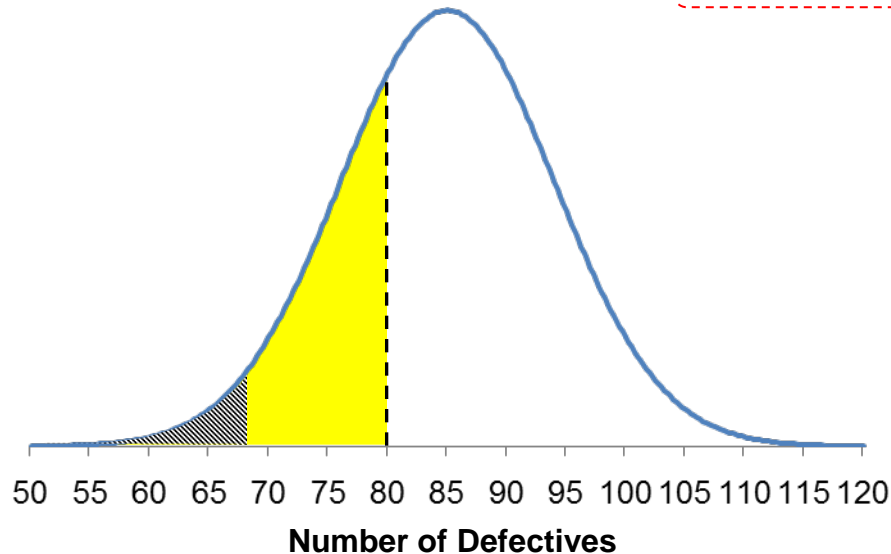
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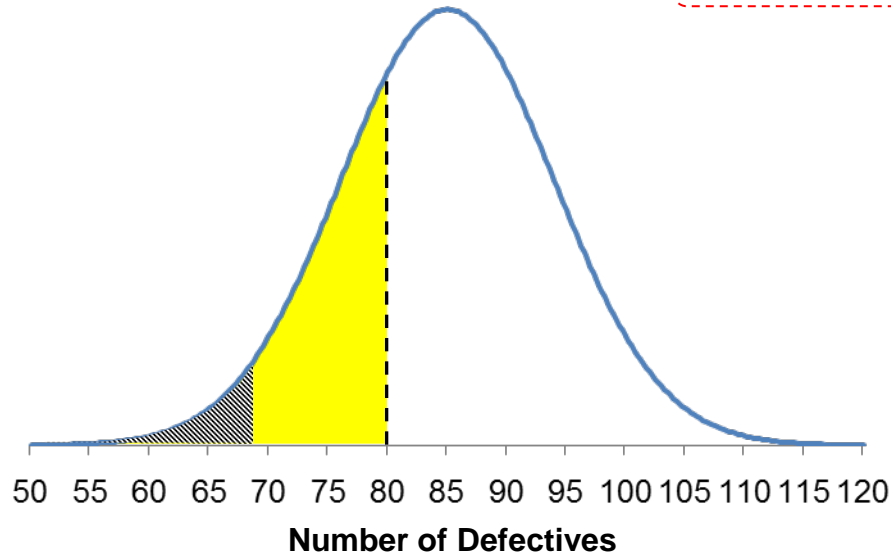
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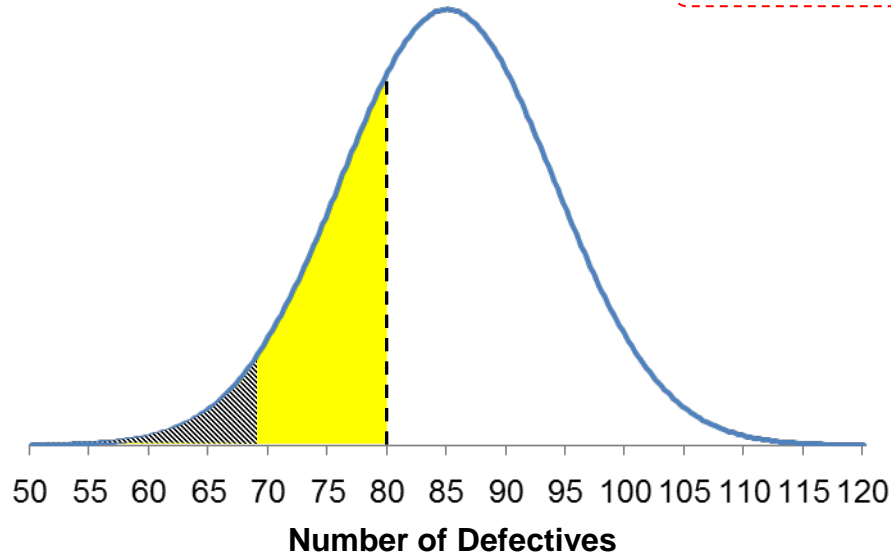
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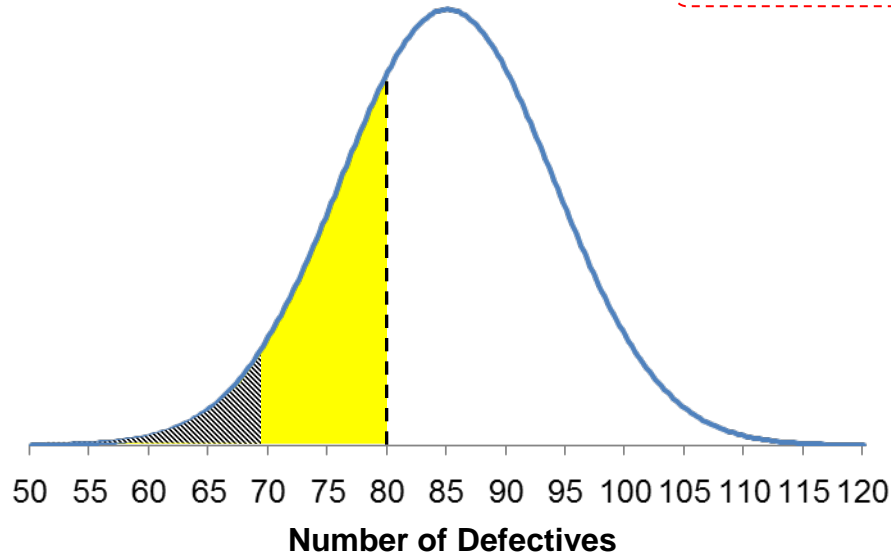
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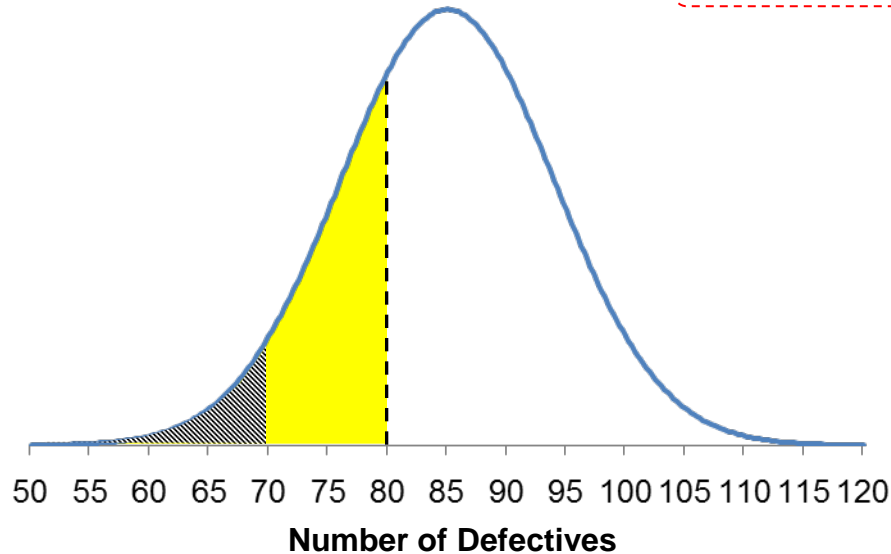
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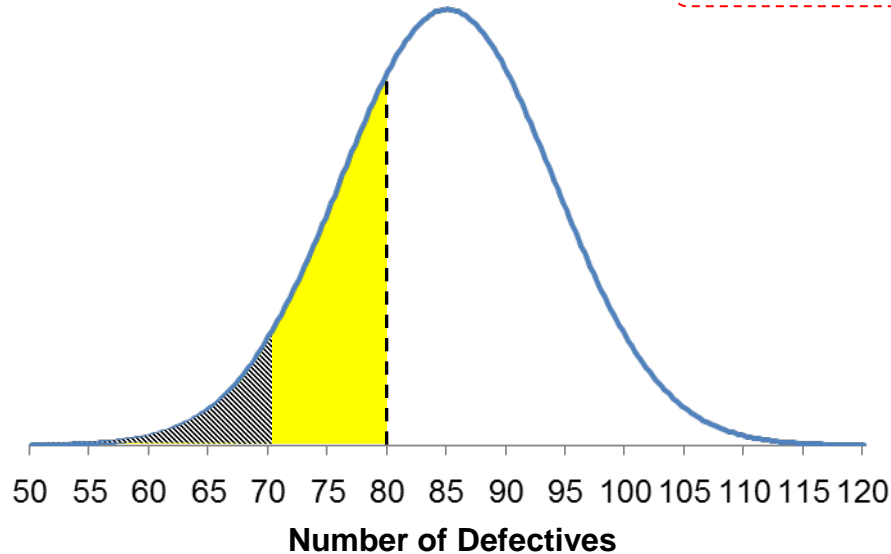
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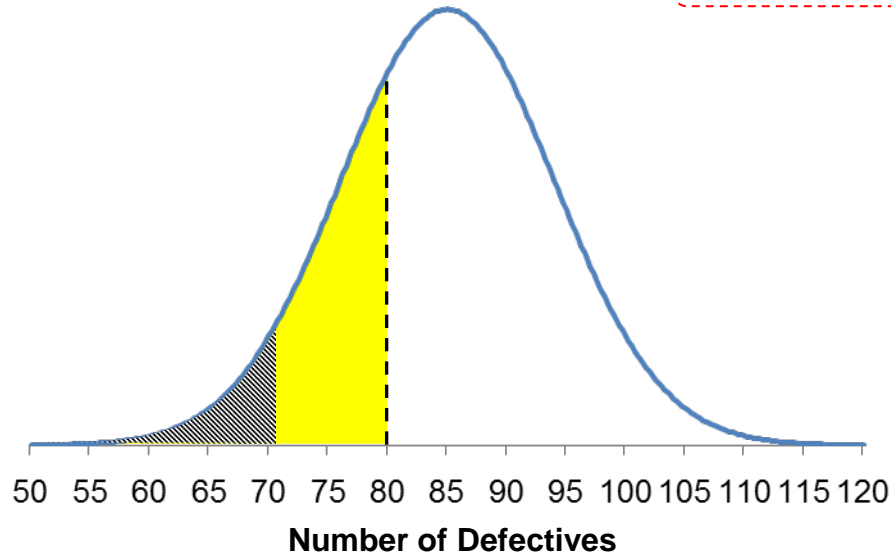
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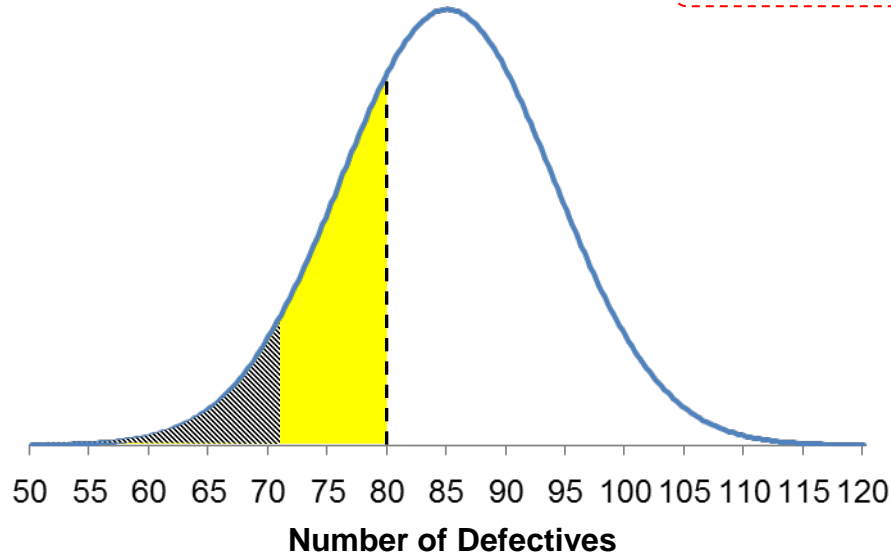
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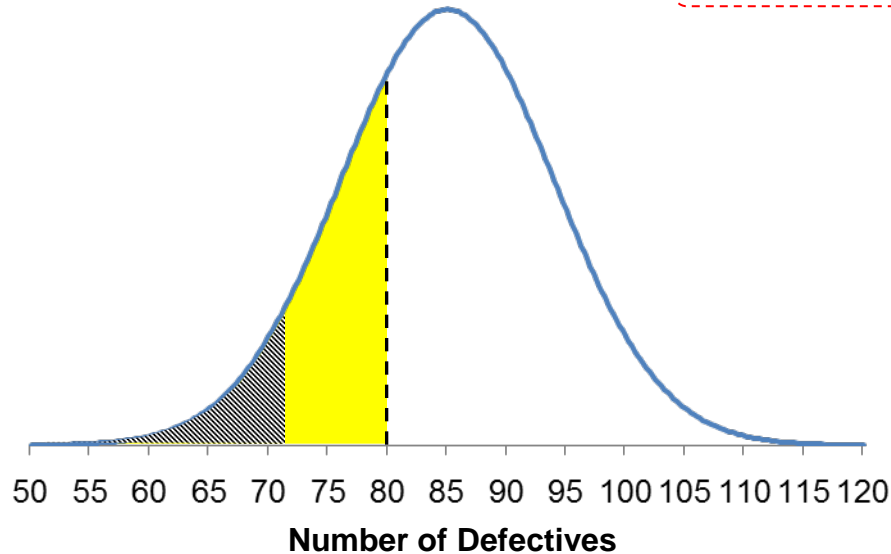
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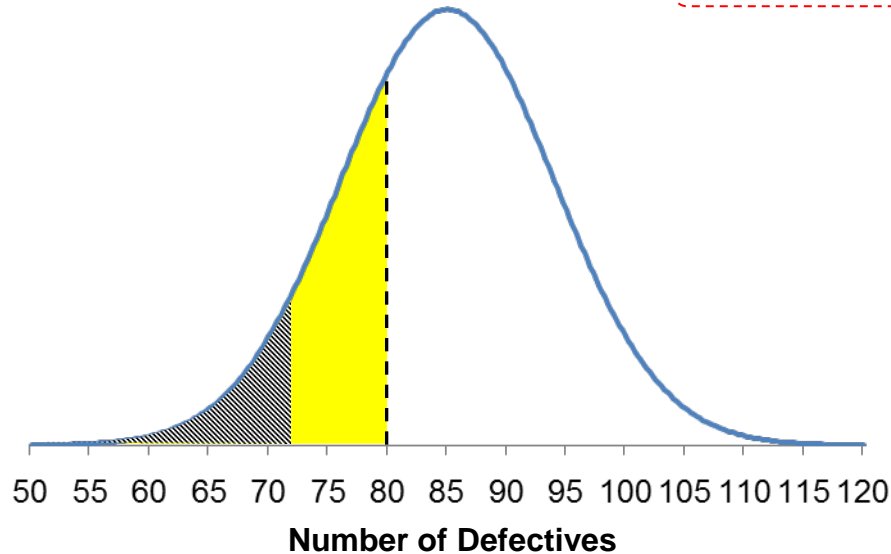
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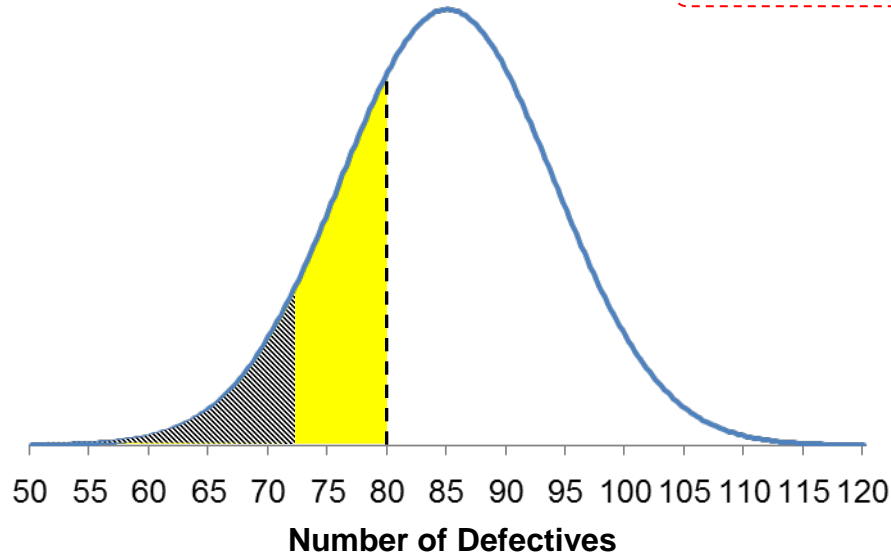
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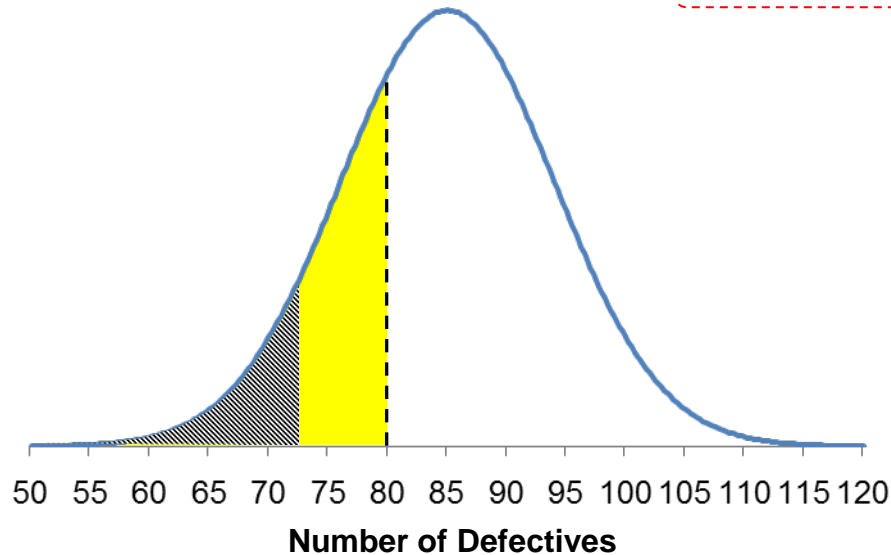
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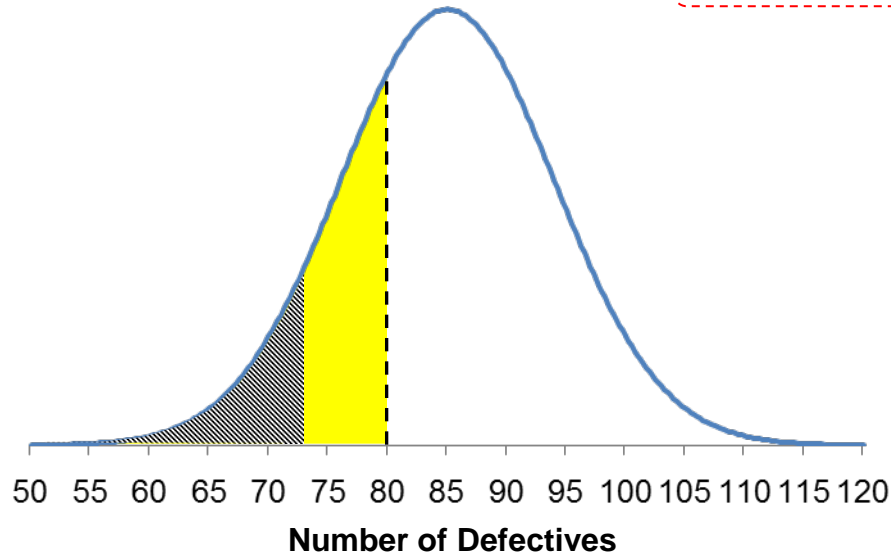
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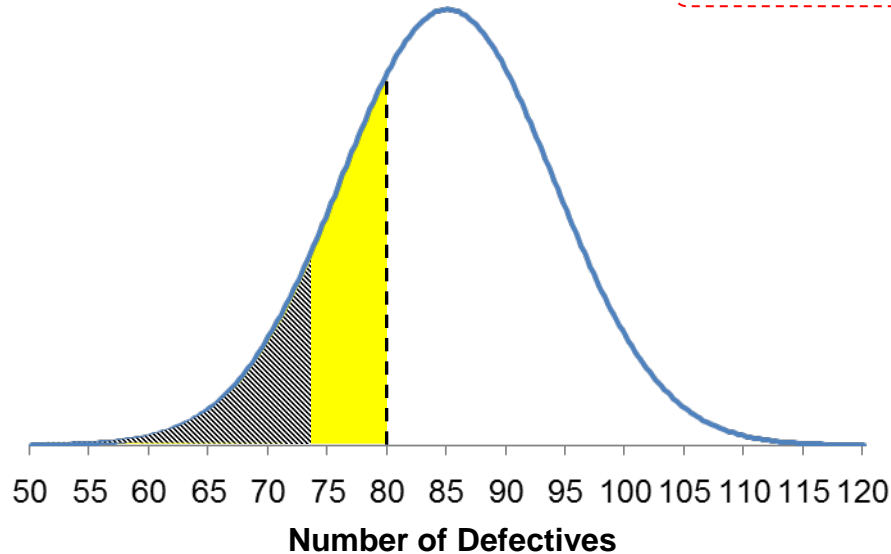
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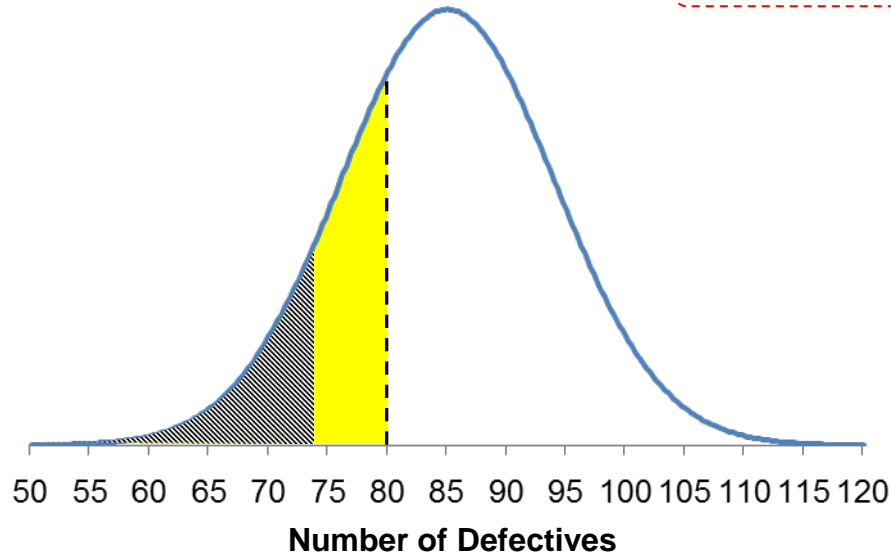
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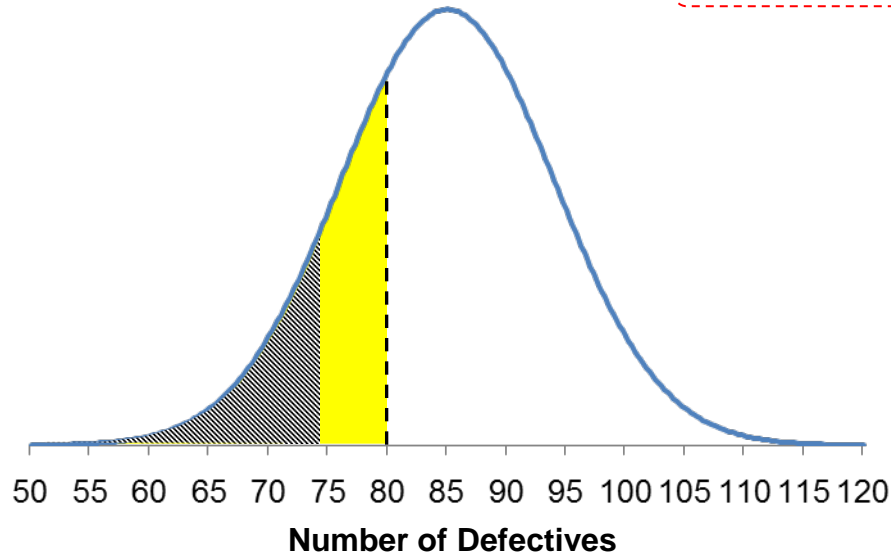
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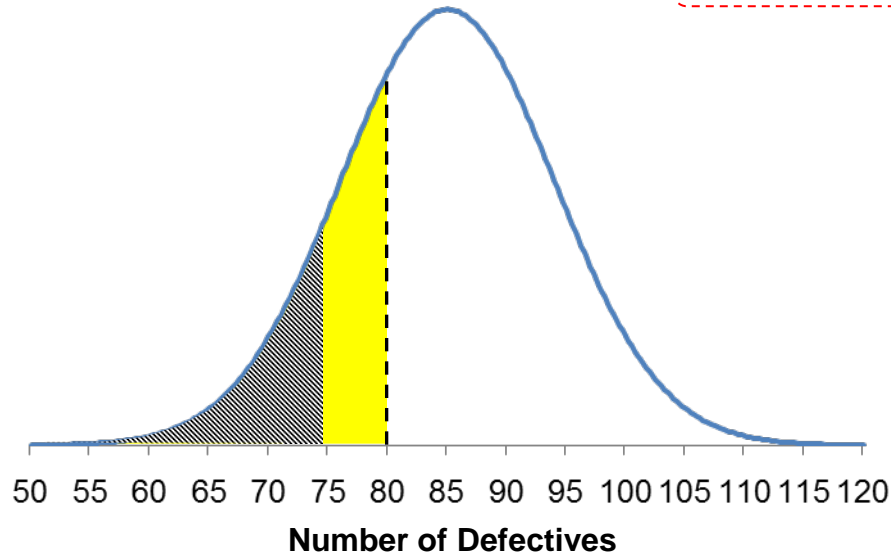
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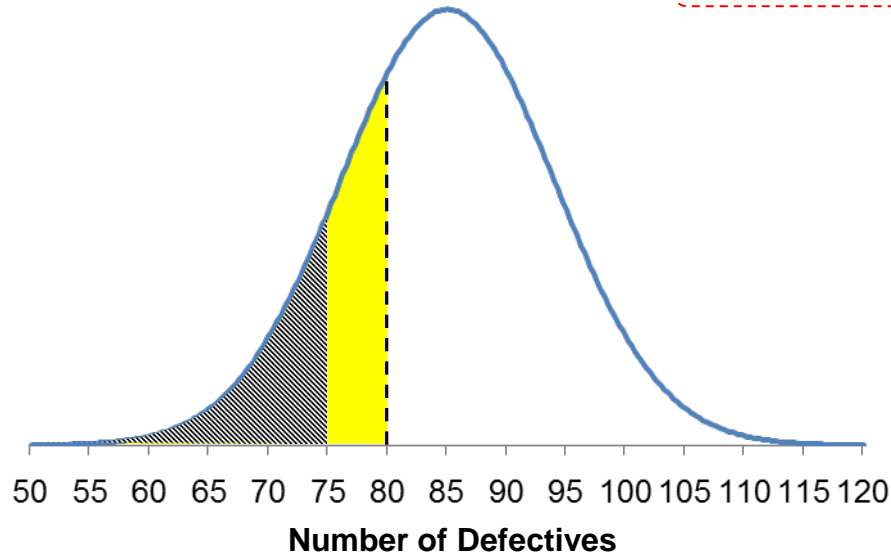
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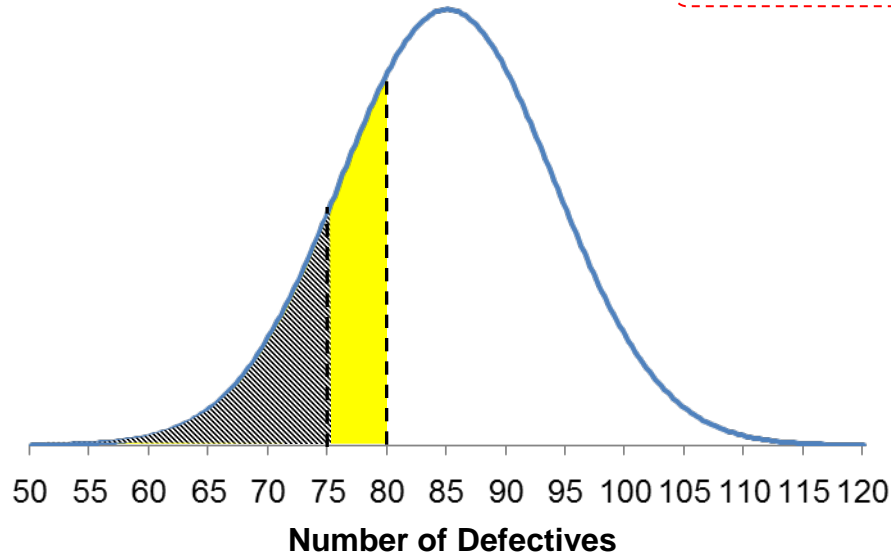
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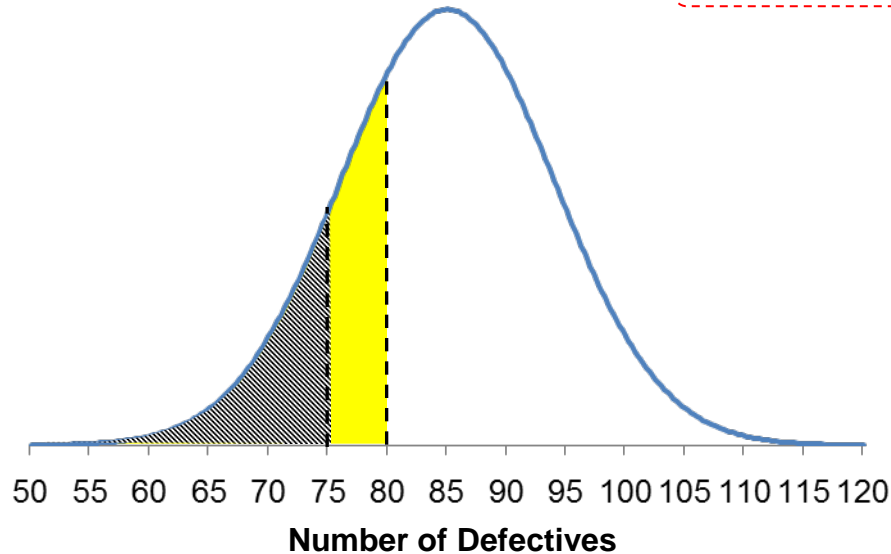
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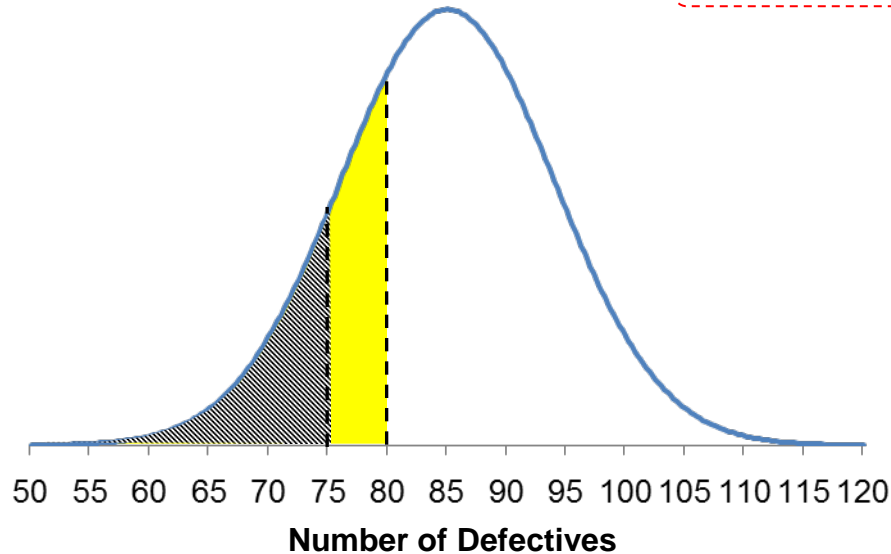
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$$\text{Prob}(\text{Defective} < 75) = ?$$

$$\text{Prob}(\text{Defective} \leq 75) = ?$$



Normal Distribution, the NORM.DIST function

Prob(Defective < 75) = ? **less than 75**

Prob(Defective \leq 75) = ?



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Prob(Defective < 75) = ? **less than 75**

Prob(Defective \leq 75) = ? **less than or equal to 75**



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less than 75: 74, 73, 72, ...



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less than or equal to 75: 75, 74, 73, 72, ...



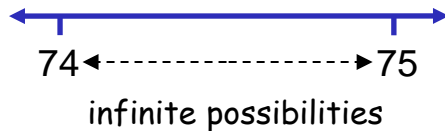
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$$\text{Prob}(\text{Defective} < 75) = ?$$

$$\text{Prob}(\text{Defective} \leq 75) = ?$$

The two probabilities are the same

...because $\text{Prob}(\text{Defective} = 75) = 0$



Normal Distribution, the NORM.DIST function

$\text{Prob}(\text{Defective} < 75) = ?$

$\text{Prob}(\text{Defective} \leq 75) = ?$

The two probabilities are the same

...because $\text{Prob}(\text{Defective} = 75) = 0$

$\text{Prob}(\text{Defective} \leq 75) = \text{Prob}(\text{Defective} < 75)$

$= \text{NORM.DIST}(75, 85, 9, \text{TRUE})$

Normal Distribution, the NORM.DIST function

NORM.DIST(x, mean, std, **TRUE**)



Normal Distribution, the NORM.DIST function

NORM.DIST(x, mean, std, **TRUE**)

Normal Distribution, the NORM.DIST function

NORM.DIST(x, mean, std, **TRUE**)

NORM.DIST(x, mean, std, **FALSE**)

Normal Distribution, the NORM.DIST function

NORM.DIST(x, mean, std, **TRUE**)

NORM.DIST(x, mean, std, **FALSE**) = **Value of the p.d.f.
evaluated at the value “x”**

Normal Distribution, the NORM.DIST function

NORM.DIST(x, mean, std, **TRUE**)

NORM.DIST(x, mean, std, **FALSE**) = Value of the p.d.f.
evaluated at the value “x”

≠ **Probability for the
random variable**

Normal Distribution, the NORM.DIST function

NORM.DIST(x, mean, std, **TRUE**)

NORM.DIST(x, mean, std, **FALSE**) = Value of the p.d.f.
evaluated at the value “x”

≠ Probability for the
random variable

We will **never** use the NORM.DIST
function with the “FALSE” option