Not just one curve

The general form

“The normal curve with mean μ and SD σ”

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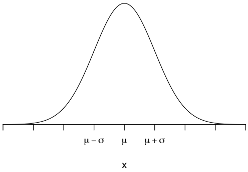

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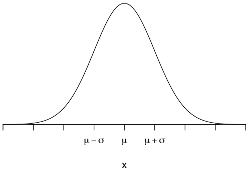

density at x

$$= \frac{1}{\sqrt{2\pi}\sigma} e^{-\frac{1}{2}\left(\frac{x-\mu}{\sigma}\right)^2}, \quad -\infty < x < \infty$$

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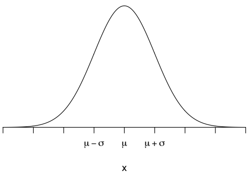

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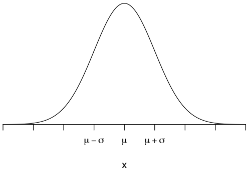

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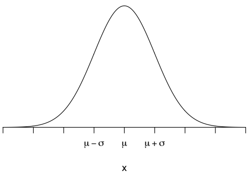

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- when converted to standard units, the curve becomes the standard normal

An imaginary ideal

"A distribution of heights follows the normal curve with mean 67 inches and SD 3 inches"

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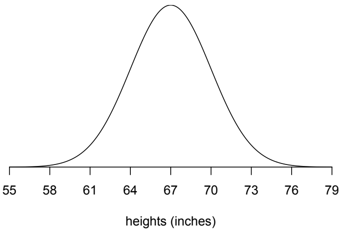

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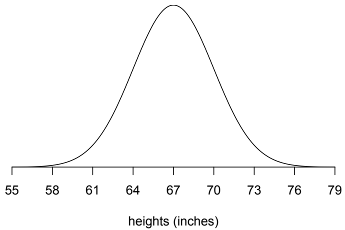

An imaginary ideal

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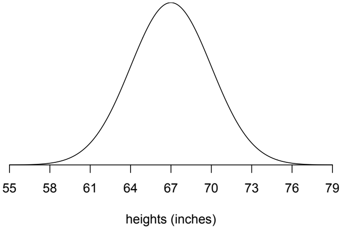
- total area = 1
- balances at 67



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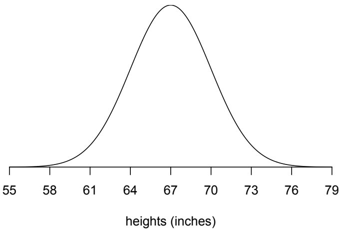

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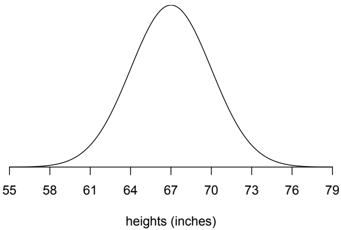

- total area $= 1$
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- when the heights are converted to standard units, the curve becomes the standard normal

Finding a percent under a normal curve

A distribution of heights follows the normal curve with mean 67 inches and SD 3 inches.

Finding a percent under a normal curve

A distribution of heights follows the normal curve with mean 67 inches and SD 3 inches. **What percent of the heights are between 63 inches and 67 inches?**

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Answer: **40.82%**.

Finding a normal percentile

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Answer in inches: $\mathbf{-0.253 \times 3 + 67 = 66.24}$ **inches**