evaluating the normal distribution

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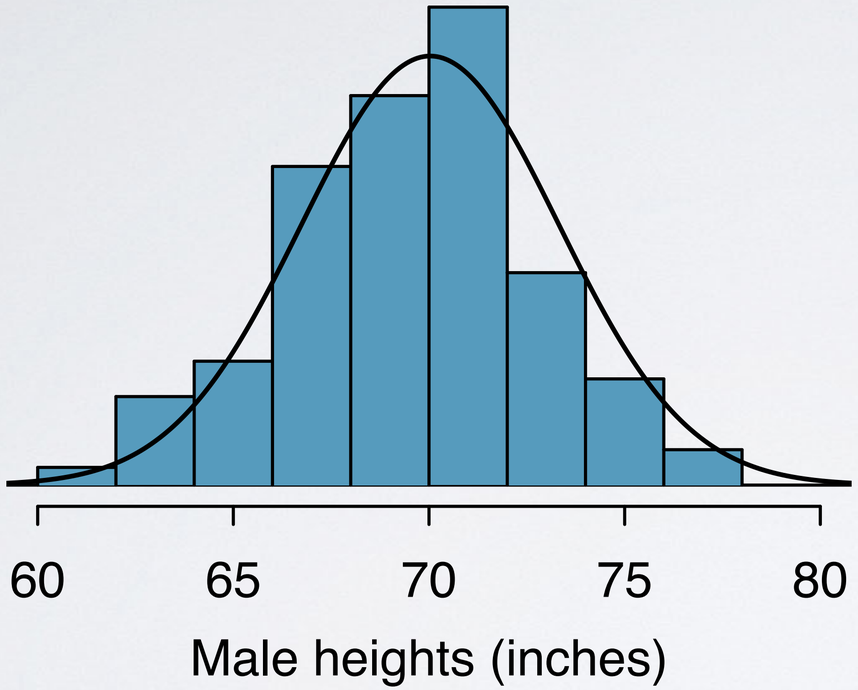
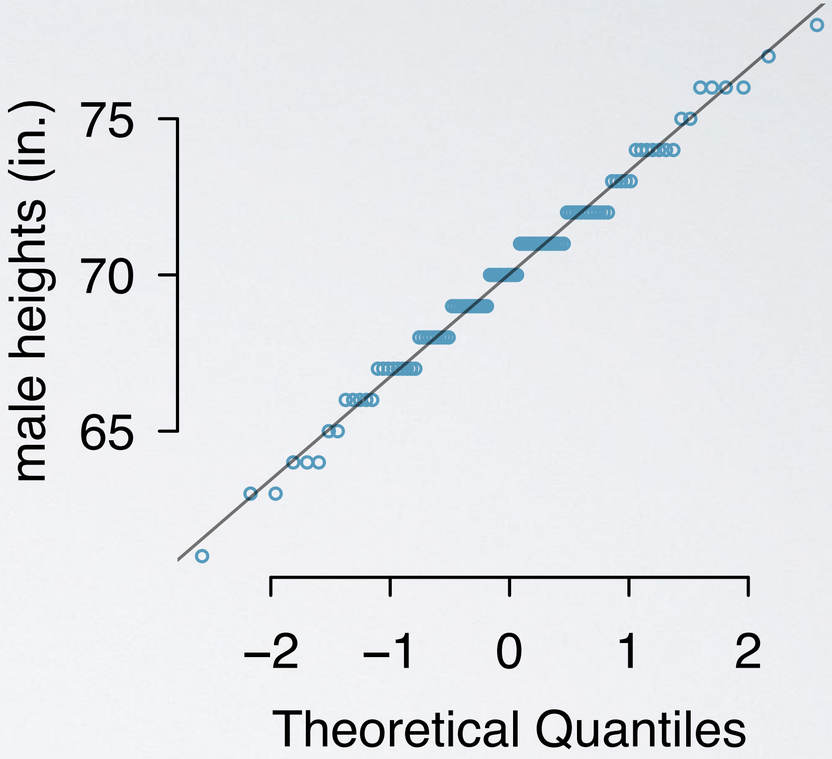
normal probability plot

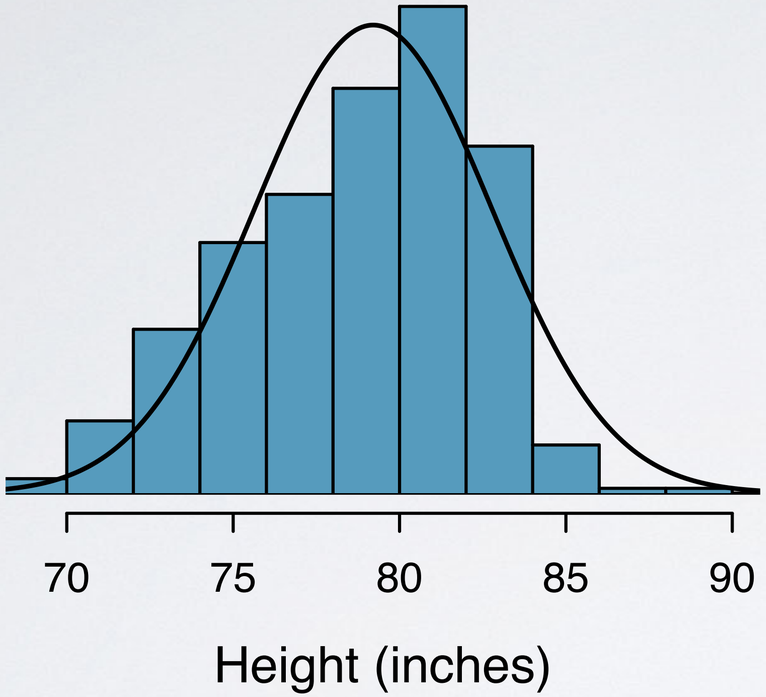


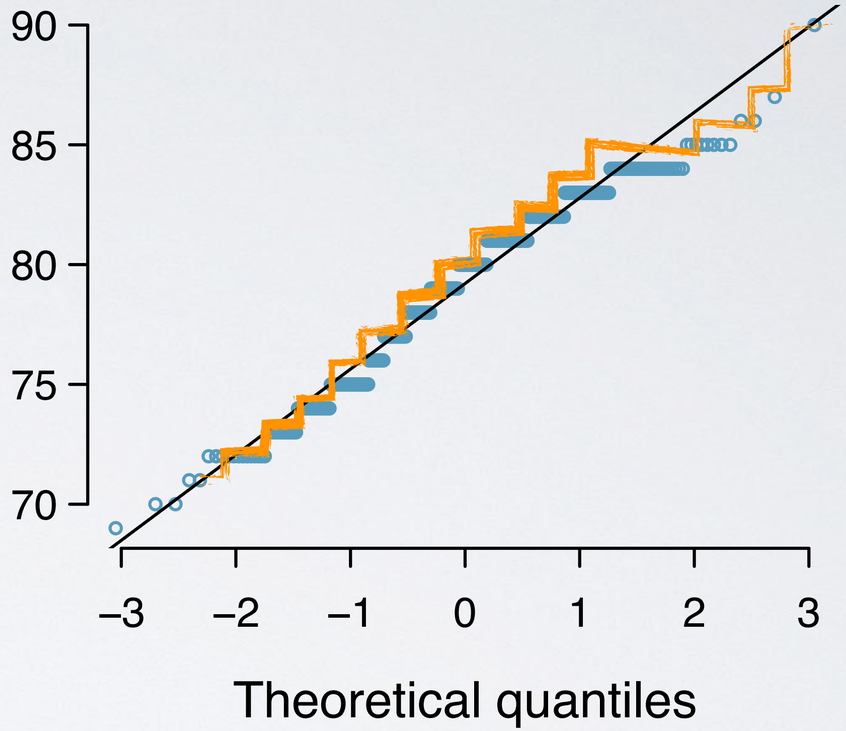


anatomy of a normal probability plot

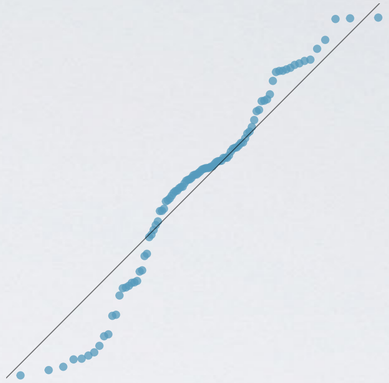
- Data are plotted on the y-axis of a normal probability plot, and theoretical quantiles (following a normal distribution) on the x-axis.
- If there is a one-to-one relationship between the data and the theoretical quantiles, then the data follow a nearly normal distribution.
- Since a one-to-one relationship would appear as a straight line on a scatter plot, the closer the points are to a perfect straight line, the more confident we can be that the data follow the normal model.
- Constructing a normal probability plot requires calculating percentiles and corresponding z-scores for each observation, which is tedious. Therefore we generally rely on software when making these plots.

heights of NBA players

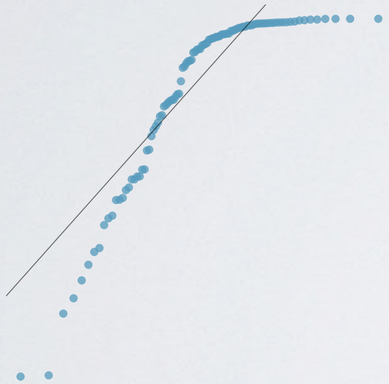




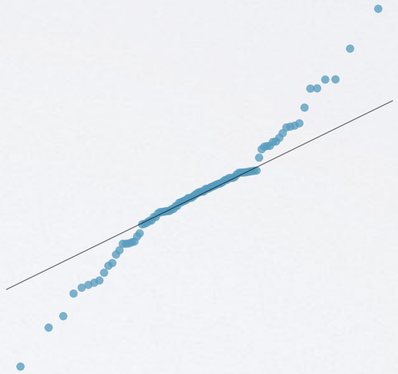
Right skew
Points bend up and to the left of the line.



Short tails (narrower than the normal distribution)
Points follow an S shaped-curve.



Left skew
Points bend down and to the right of the line.



Long tails (wider than the normal distribution)
Points start below the line, bend to follow it, and end above it.

68-95-99.7% rule