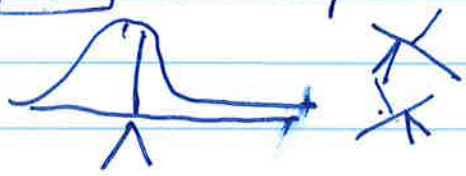
Stat 202-2015s W3-Fri

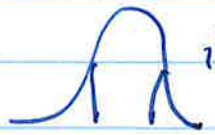
Review

	data	distribution
Mode	peak of data	peak of density cv
median	half data below	half area below
quartiles	divide data into quarters	divide area
mean	formulas in terms of data	formulas in terms of integrals
std dev		

mean → balance point



std → inflection point of Normal density (bell curve)



68-95-99.7 Rule

Normal only:
- 68% of area within 1 std dev
- 95% of area within 2 std devs
- 99.7% of area within 3 std dev

Standardizing observations (data)

Use linear transformation transforming your data (x) (old variable) into z-scores (z) (new variable

$$z = \frac{x - \mu}{\sigma}$$ where μ is mean of your data
σ is its Std dev

Note can do this with any data set as soon as you calculate its mean and std dev

No matter what distribution your data has (Normal or otherwise), its z-scores will have mean 0 and std dev. 1

If your data has Normal distribution your z-scores will also have Normal distribution

Conversely, if your ~~data~~ z-scores have Normal distribution then your data must have had Normal distribution

If One of them doesn't have Normal distribution The other also doesn't.

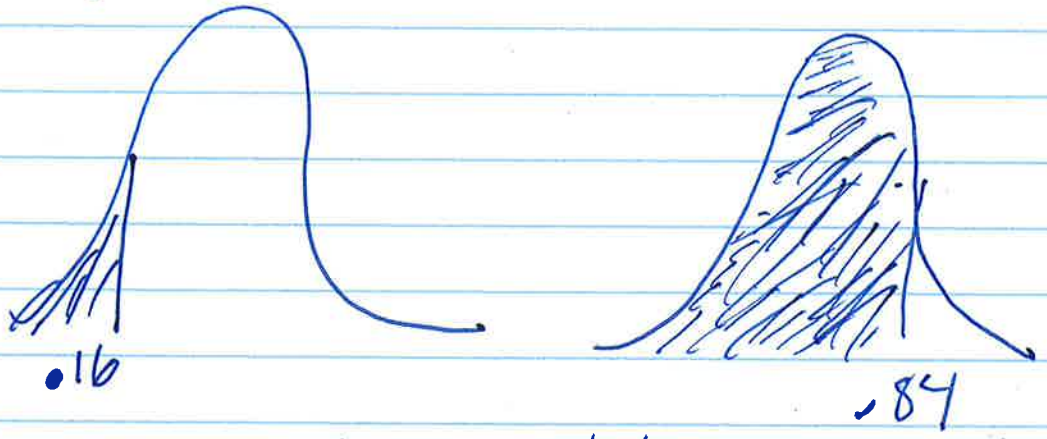
Stat 202 - 2015S - W3 - Fri

$N(\mu, \sigma)$ denote a normal distribution with mean μ and std dev σ,

$N(1201, 320)$ denotes a normal distribution with mean 1201 and std dev 320.

$N(0, 1)$ denotes the standard Normal distribution (mean 0 and std dev 1),

New: A cumulative proportion is the proportion of observations in a distribution that lie at or below a given value



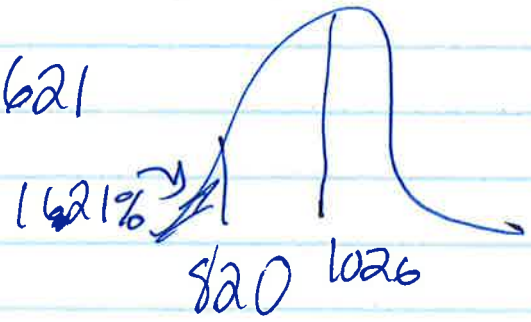
two cumulative proportions

Tables for Normal distributions convert z-scores into cumulative proportions

Stat 202-20155-W3-Friday

Cumulative proportions can be used to calculate other areas

Example: Scores of SAT test were approximately Normal with mean 1026 and std 209
820 is the cutoff for division I athletes to compete in first year
The cumulative proportion for 820 is .1621



The area to right of 820 is

total area − area to left of 820
1 − .1621
.8379 or 84%

The area between 720 and 820

is area to left of 820 minus area to left of 720

about 9% of students who take SAT have scores between 720–820

.1621 − .0716
.0905
9.05%

Show statcrunch

Normal Calculator

mean 1026
Std dev 209

$X \leq 720$ | proportion = .25

quartile
percentile
{ greater than
{ between

Z-scores