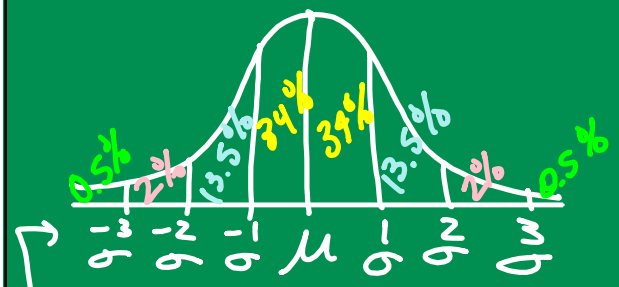
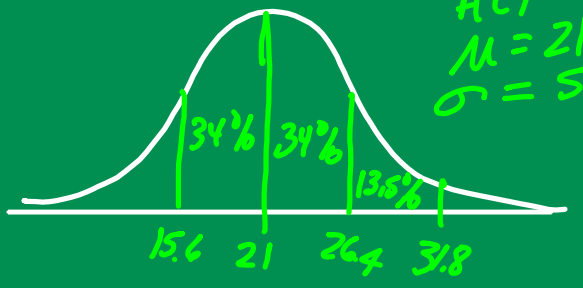
October 25, 2024

Normal Distribution





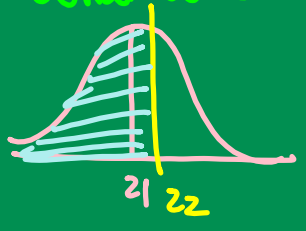
ACT
$\mu = 21$
$\sigma = 5.4$

z-score = # of Standard deviations from the mean

small st. dev.

large st. dev.

Melody scored 22 on the ACT.
What was her percentile rank?

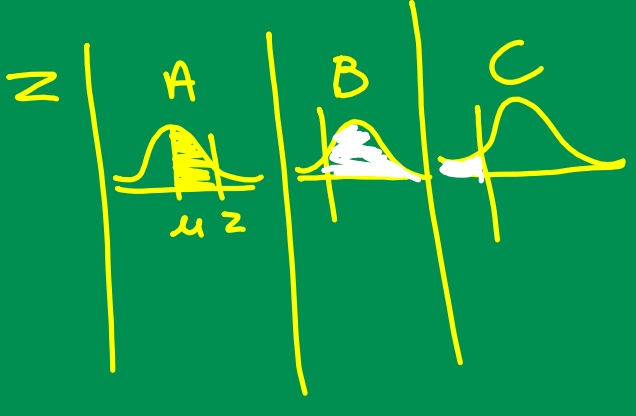


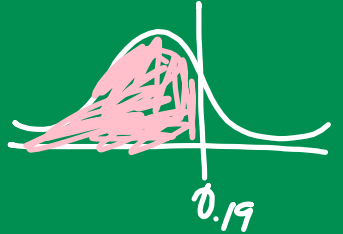
$$\frac{22-21}{5.4} = \frac{1}{5.4} = 0.185 \approx 0.19$$

$$Z = \frac{x - \mu}{\sigma}$$

$$\frac{\text{Raw Score} - \text{Mean}}{\text{St. Dev.}}$$

only for population data!





0.5753 ≈ 58th percentile

2022 Football

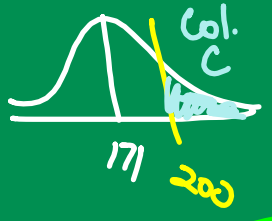
$\mu = 171$ lb.

$\sigma = 42.7$ lb.

45 player

Thunder football team weights are normally distributed.

How many players weigh over 200 lb.?



$$Z = \frac{x - \mu}{\sigma} = \frac{200 - 171}{42.7}$$

$$Z = 0.68$$

0.2483

× 45

11.1735

≈ 11 players

Coach will cut smallest 20%? What is the cutoff weight?

$-0.84 = \frac{x - 171}{42.7} \cdot 42.7$

$-35.868 = x - 171$

$+171 \quad +171$

$135.13 = x$

135 lb.

Calculator:

Need % = Normalcdf

Need Raw score: Inverse Normal