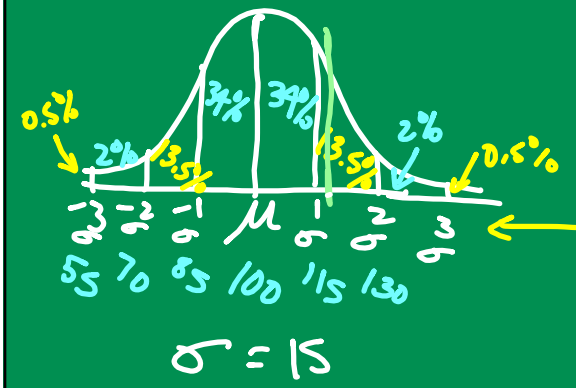
October 24, 2025

NORMAL DISTRIBUTION - only done with population data



$\sigma = 15$

$$Z = \frac{120 - 100}{15} = \frac{20}{15} = 1.33$$

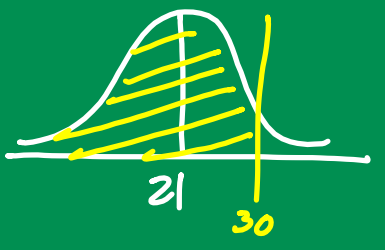
→ # of standard deviations from the mean

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

ACT Scores

$\mu = 21$

$\sigma = 4.7$



Ronald = 30

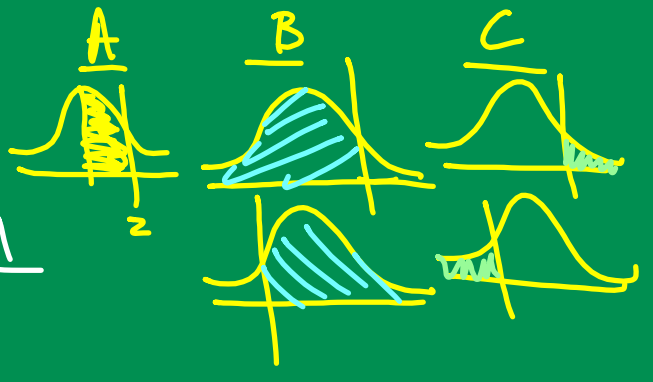
What is his percentile rank?

$$z = \frac{x - \mu}{\sigma} = \frac{30 - 21}{4.7}$$

$$z = 1.91$$

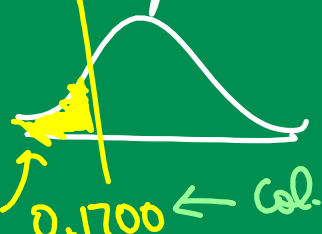
Col B = 0.9719

97th



Beatrice scored at the 17th percentile

What was her raw score?



0.1700 ← Col. C

$z = 0.95$

$$4.7 \cdot -0.95 = \frac{x - 21}{4.7} \cdot 4.7$$

$$-4.465 = x - 21$$

$+21$

$$16.535 = x$$

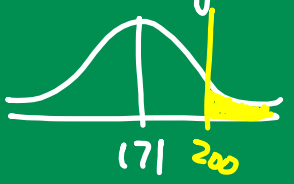
NC 2022 Football

$\mu = 171$ lb

$\sigma = 42.7$ lb

44 players

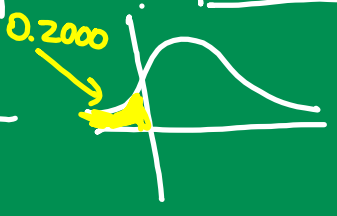
How many players weigh over 200 lbs?



$$z = \frac{200 - 171}{42.7} = 0.68$$

$0.2483 \times 44 \approx 11$ players

Coach Glatzak will cut lightest 20%. What is the cutoff weight?



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

$-35.868 = x - 171$

$135 \text{ lb.} = x$

To Find %:

normalcdf

To find raw score

InvNorm

Must enter the % to the left of the z-score.

Example: If you want to find the cutoff score for the top 25% of ACT scores, you would need to enter 0.75 as the Area in your calculator.