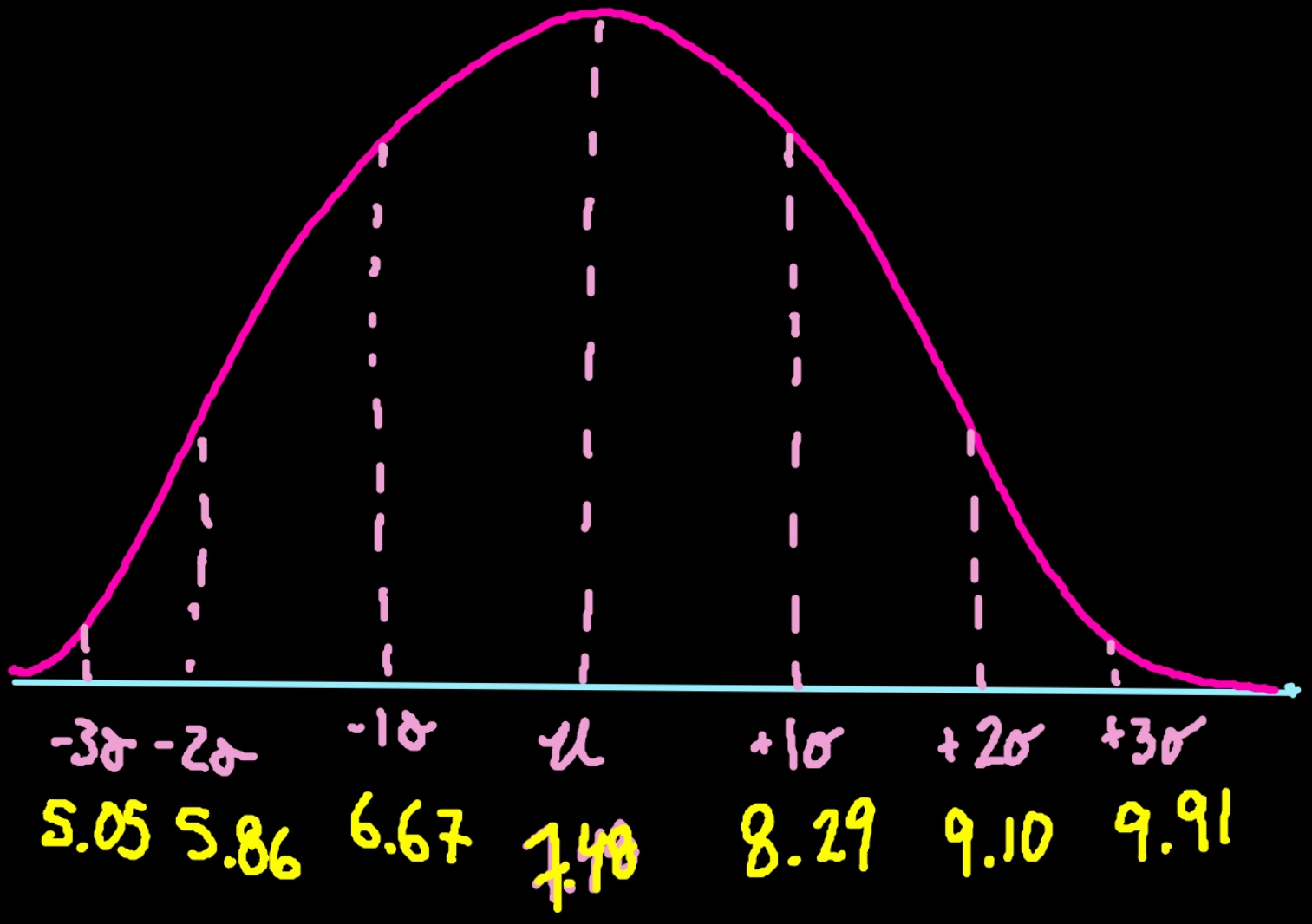
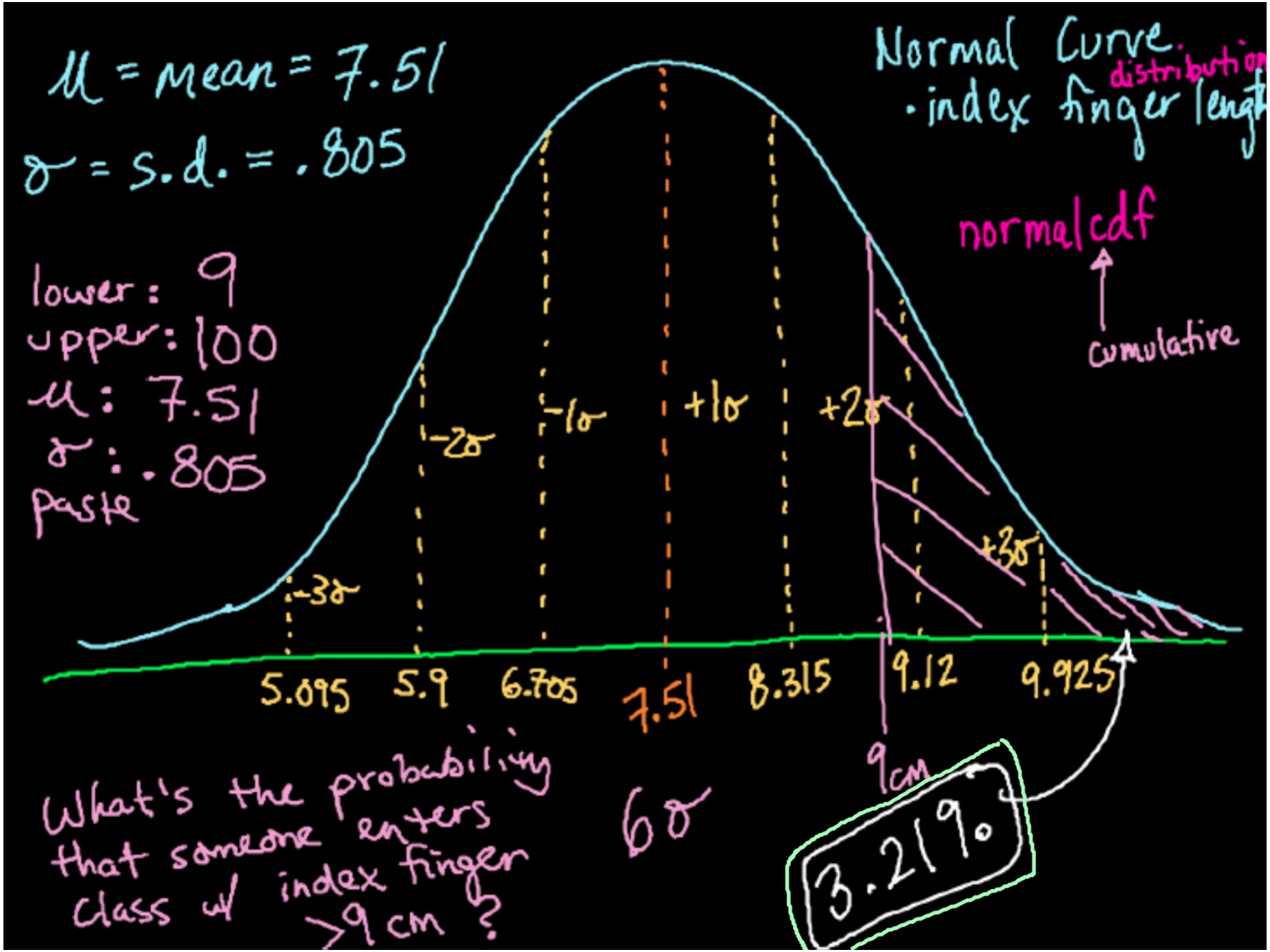
Finger stats

$\mu = 7.48$

$\sigma = .807$

Finger normal distribution




μ = mean = 7.51
σ = s.d. = .805
Normal Curve
distribution
· index finger length
normalcdf
cumulative
lower: 9
upper: 100
μ: 7.51
σ: .805
paste
-3σ
-2σ
-1σ
+1σ
+2σ
+3σ
5.095
5.9
6.705
7.51
8.315
9.12
9.925
9cm
What's the probability that someone enters class w/ index finger >9 cm?
6σ
3.21%

Today's learning objective:

By the end of class, I will be able to calculate probability via z-scores and
z-scores from probability.

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

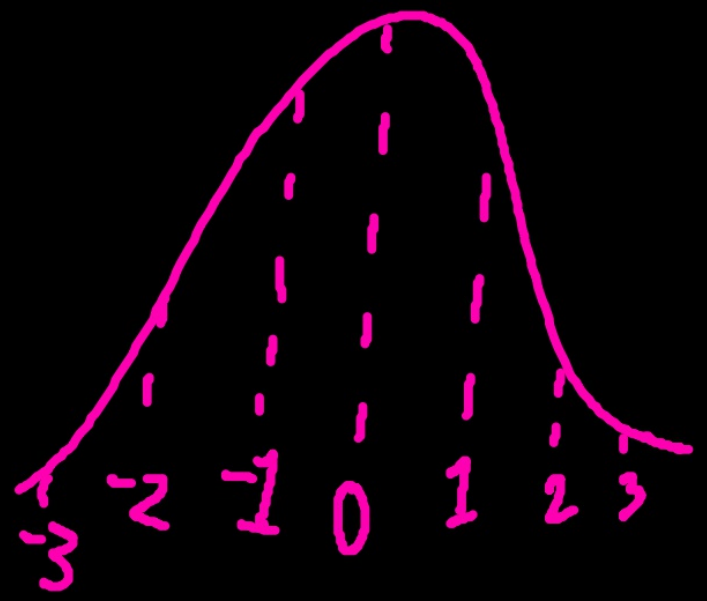
Today's language objective:

Inverse normal
Normal
Z-score
Mean, standard deviation
Standard μ, standardized σ

We used our knowledge of normal distributions to calculate the probability that, if a new student walked into our class, he or she would have a 9cm length finger or longer.

How can we standardize this information so someone could understand the improbability easier?

*Use a z-score



1.) Calculate z for a person with a 6 cm or shorter finger. Does this appear to be a high or low probability event?

$\mu = 7.48$

$\sigma = .807$

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

$$z = \frac{6 - 7.48}{.807} = \underline{-1.84}$$

2.) The probability that a person has a finger of a certain size or greater is 10%. How long is the finger?

Low: 8.5

Upper: 10

8.51 cm

$\mu = 7.48$

$\sigma = .807$

.1022

10.22%

inverse Normal

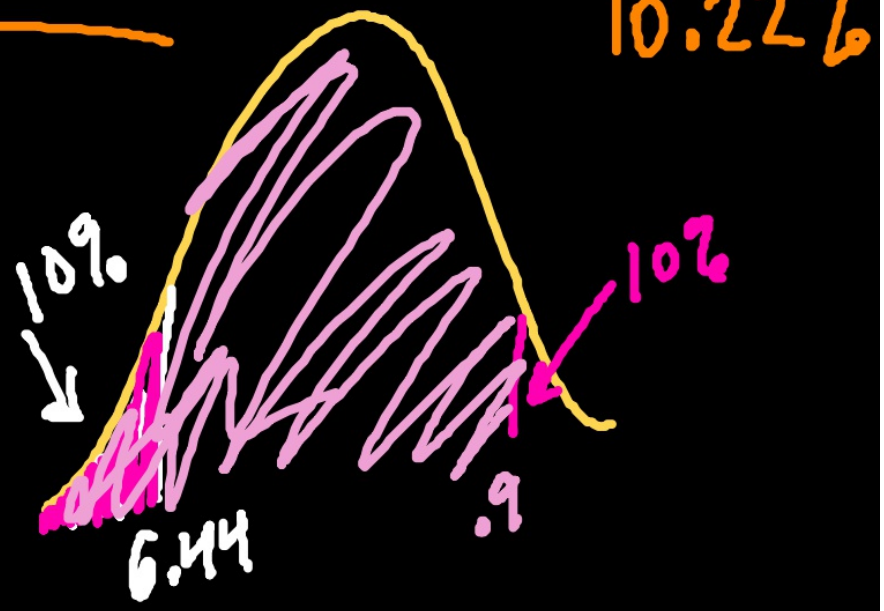
invNorm

Area: .1

μ:

σ:

6.44 cm



What if we were given a probability and needed to work backwards?

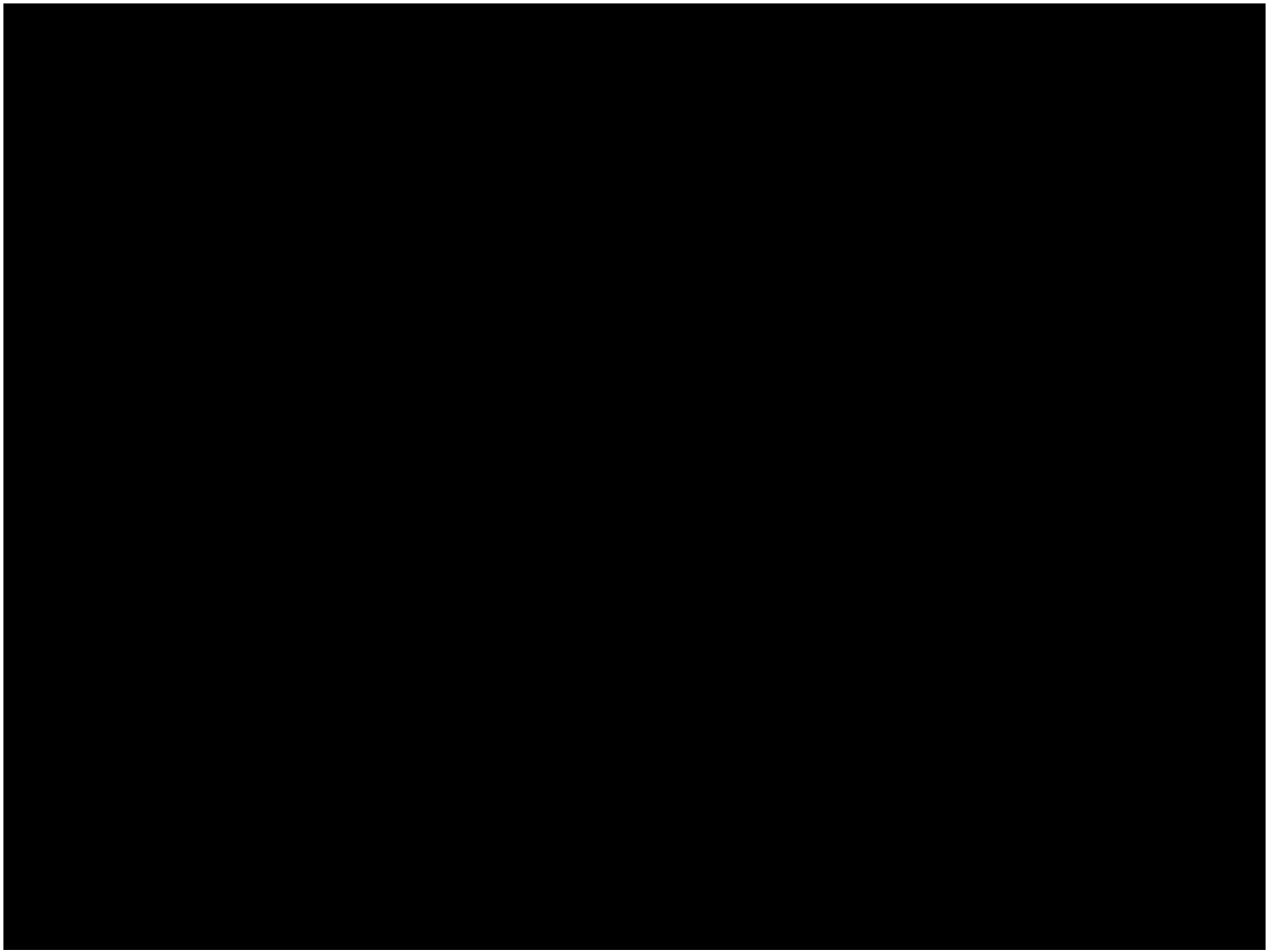
*For example, 40% of oranges have a circumference of 20cm or less.

invNorm z=.253

Which value of z satisfies this constraint?

*Only 10% of oranges have a circumference of greater than 27cm.

Which value of z satisfies this constraint?



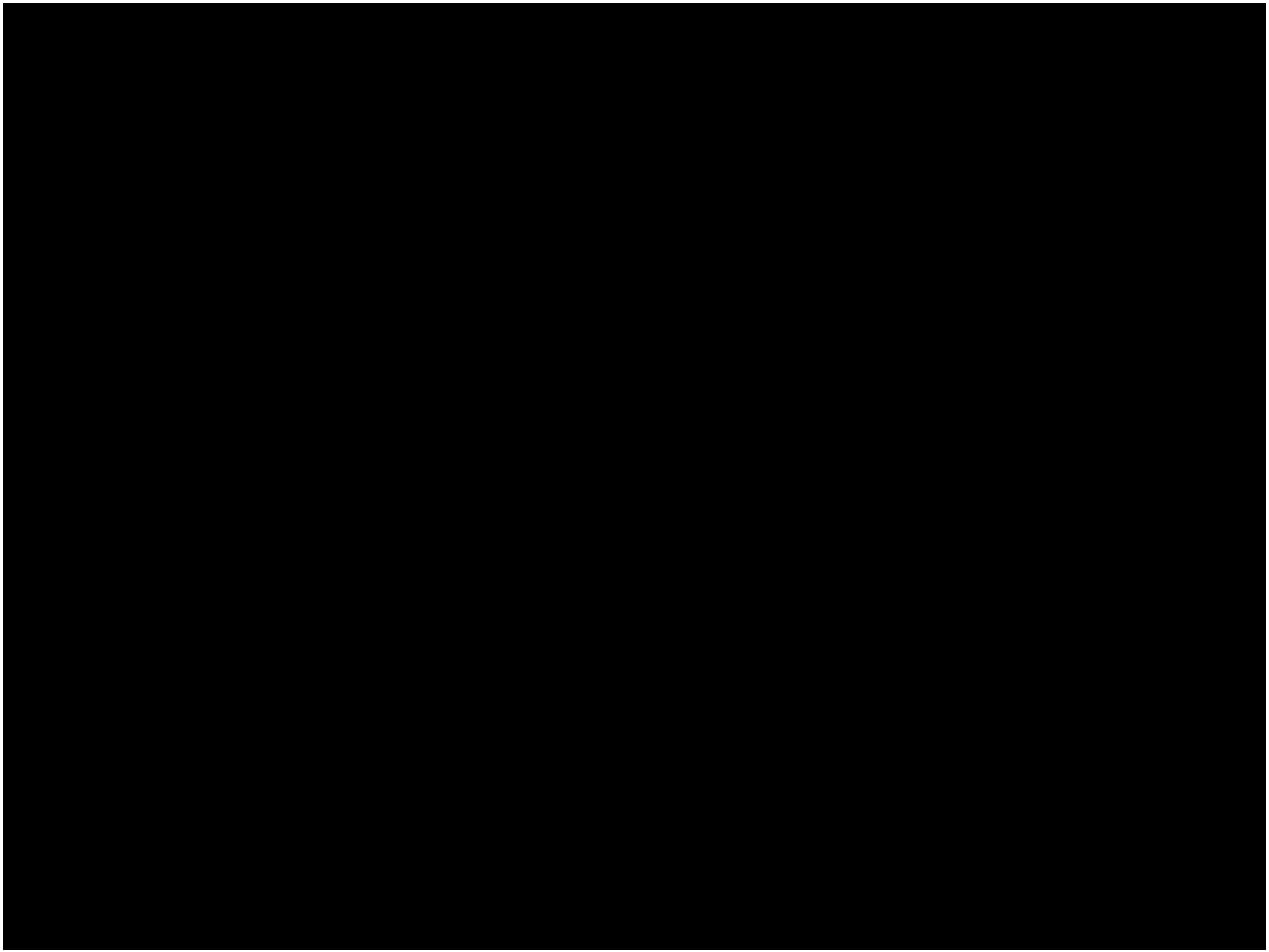
The weights of frogs are normally distributed with a mean of μ and a standard deviation of σ.

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

80% of frogs weigh less than 25g.

3% of frogs weigh more than 27g.

Find the μ and σ.



The speed of cars at a certain point on a straight road are normally distributed with a mean of μ and a standard deviation of σ.

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

10% of the cars traveled at a certain speeds greater than 90 kmh and while 15 percent of them traveled at a speed of less than 35 kmh. Find μ and σ.