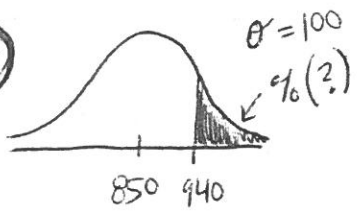
Solutions:

Problem 1: (X → %) **(B)**



* Given X (940)
* Looking for a %

X → Z → %

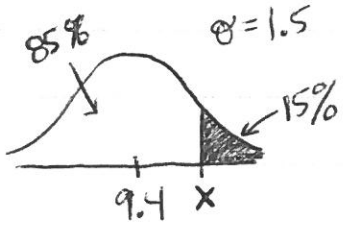
step 1: $z = \frac{X-\mu}{\sigma} = \frac{940-850}{100} = .90$

step 2: normalcdf (Z_L, Z_R)

normalcdf $(.90, 10^{99}) = .184$

∴ 18.4% of girls Molly's age can eat more pancakes than her.

Problem 2: (% → X) **(C)**



* Given a %
* Looking for X (# of Jumping Jacks)

X ← Z ← %

step 1: invnorm (percent ILE)

invnorm (.85)

= 1.036 (z-score)

step 2: Solve for X.

$X = z\sigma + \mu$

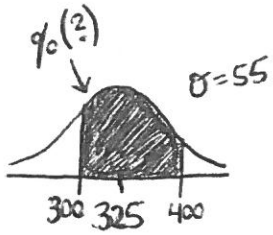
$X = 1.036(1.5) + 9.4$

$X = 10.954$

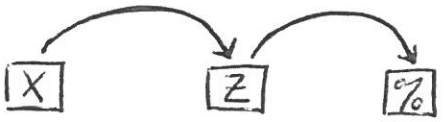
∴ Reginald will have to do 10.95 jumping jacks to be in the top 15%.

Problem 3: (A)

$(X_1 < \% < X_2)$



★ Given 2 X values (#'s of CHAIRS)
★ Looking for a % between X's



step 1: $Z_L = \frac{X_L - \mu}{\sigma} = \frac{300-325}{55} = -.455$

$Z_R = \frac{X_R - \mu}{\sigma} = \frac{400-325}{55} = 1.364$

(found a z-score for each of my X values)

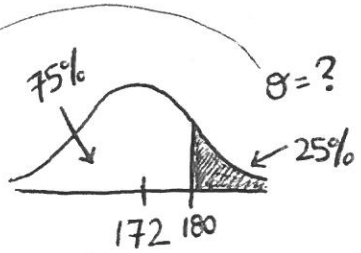
step 2: normal cdf (Z_L, Z_R)

normal cdf $(-.455, 1.364) \approx .589$

∴ 59% of the people in MA own between 300 and 400 chairs.

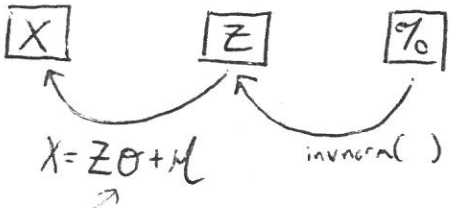
Problem 4: (E)

(find the missing parameter)



THERE IT IS!

★ GIVEN X and %



step 1: invnorm(percent ≤LE)

invnorm(.75) = .6745 ← Z-SCORE

step 2: use the z-score formula to solve for σ.

① $z = \frac{X-\mu}{\sigma}$

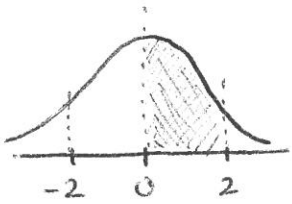
② $.6745 = \frac{180-172}{\sigma}$

③ $.6745\sigma = 8$

④ $\sigma = 11.86$

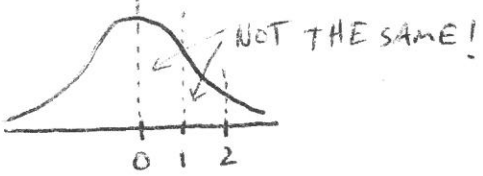
∴ the Standard Deviation is 11.86 inches.

Problem 5: (D) II only



★ Statement II is true by symmetry

★ Statement I is false because .4772 is not two times .3413



★ The IQR of a standard Normal Curve is 1.34

Problem 6: (E) I, II, and III

★ The area under the Normal Curve is <u>always</u> 1.

★ Always centered around μ, and μ is different depending on the model.

★ The standard deviation determines the height and spread.