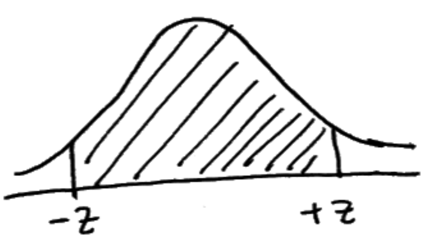
WORKING W/ THE STANDARD NORMAL TABLE

1) Table A 105 gives



1) If I ~~ad~~ ask you for the area between -.8 and +.8 read it straight off the table 57.63% ≈ 58% (note I rounded the area up)

So. What is the area between -1.25 and +1.25?

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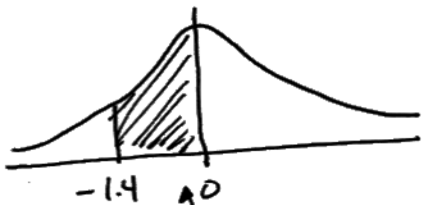
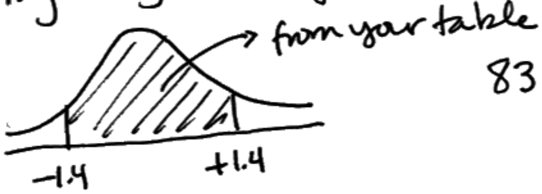
2) What is the area between -1.4 and 0?

a) draw a picture!



b) by symmetry



83.85 → divide this by 2 = 41.925 ≈ 42%

So. What is the area between 0 and 0.5?

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3) TAILS!

find the area to the left of z = -1.0 and to ~~that~~ the right of z = 1.0

a) well, the middle is 68.27 so

b) 100% - 68.27% = 31.73% total tails ≈ 32%

c) each tail is $\frac{31.73}{2}$ = 15.865 ≈ 16%

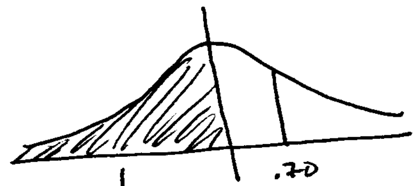
or $\frac{1}{2}(100 - \text{Area}(z))$

THOSE ARE THE BUILDING BLOCKS!

4) Now What's the area to the left of $z = .70$?

a) draw a picture!

b) well, you know that →



c) area between $\pm .70$ is 51.61

d) the area to the left of $z = .70$ is

$$50\% + \frac{51.61}{2} = 75.805 \approx 76\%$$

OR

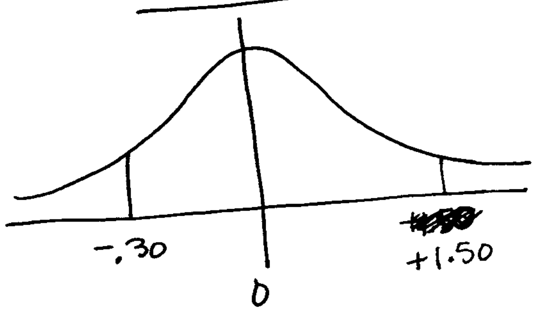
e) 51.61% + one "tail"

↳ $\frac{1}{2}(100 - 51.61) = 24.195\%$

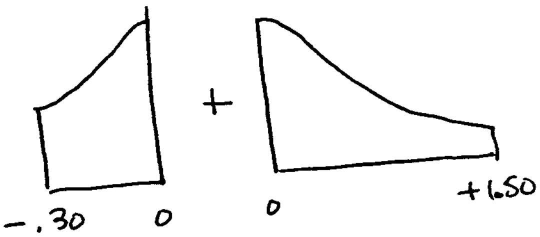
$$51.61\% + 24.195\% = 75.805\% \approx 76\%$$

[note - I carry 2 or more digits until the end!]

5) A WEIRD AREA! HOW?



⇒



(go back to step 2)

$$\frac{23.58}{2} + \frac{86.64}{2} = 55.11\% \approx 55\%$$

or

$$\left(\frac{23.58 + 86.64}{2}\right) = 55.11\% \approx 55\%$$

Normal Approximation – Using the standard normal curve to help you make statements or learn more about a distribution of data

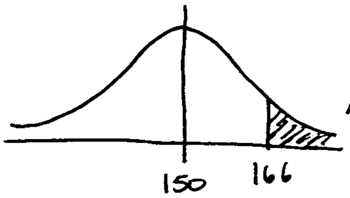
1)

Law School Admissions Test

$\bar{X} = 150$ approximately normal

$SD = 10$

draw!



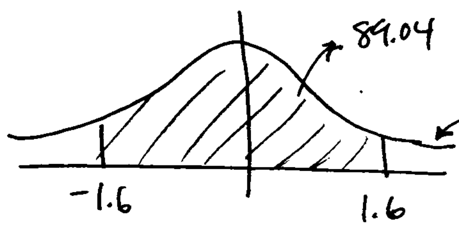
a) WHAT % score above 166

b) To answer – you must convert the raw score to a z score and then look up the area associated w/ z.

$$\frac{166 - 150}{10} = \frac{16}{10} = 1.6 = z$$

$$\left(\frac{\text{observation of interest} - \text{mean of the distribution}}{\text{Standard dev. of distribut.}} \right) = z$$

c)



$\frac{100 - 89.04}{2} = 5.48 \approx 5.5\%$

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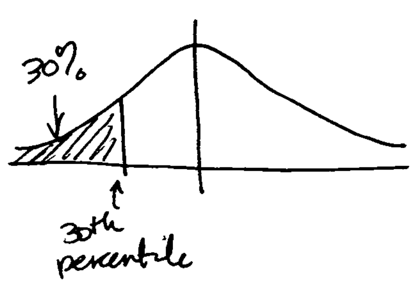
2) Exercise Set E p. 92 # 3

$\bar{X} = 3.0$

$SD = 0.5$



that's a tail →

approx. = −.50

extrapolation $z = -.52$

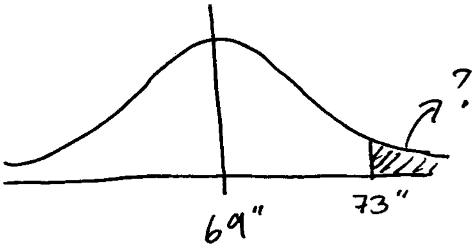
a tail of 30% implies a "middle" of ≈ 40%

note: Freedman ROUNDS DOWN HERE

40% is approximately $z = \pm .50$ it's close but not exceeding 40%

3) Rounding up & down

Men's Heights $\bar{x} = 69''$ $SD = 2.6''$

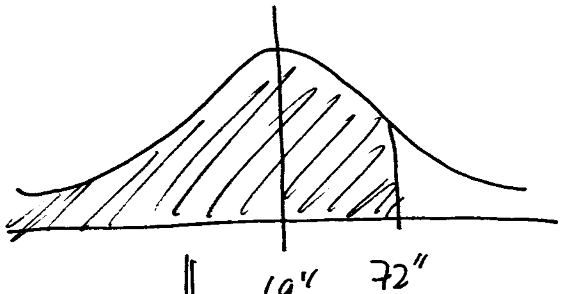


$$z = \frac{73-69}{2.6} = 1.538 \approx 1.54$$ (rounded up)

but choose approximate $z = 1.50$ if you talk about percentages (round down)

this is being **conservative** (choosing the one closer to the center)

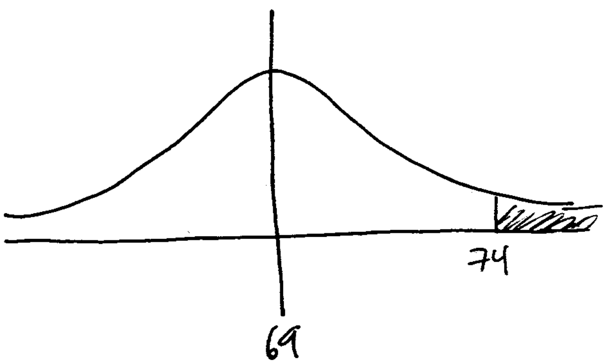
$$\frac{100 - 86.64}{2} = 6.68\%$$



87.495% or 87.5%

$$z = \frac{72-69}{2.6} = 1.154 \approx 1.15$$ (rounded down)

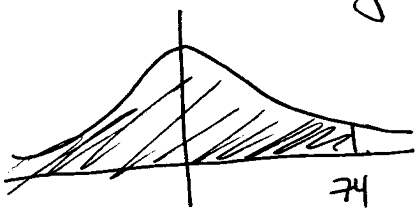
read this one straight



$$z = \frac{74-69}{2.6} = 1.923 \approx 1.92$$ (rounded down)

again choose (rounded down again) 1.90 **or** extrapolate

4) Extrapolating

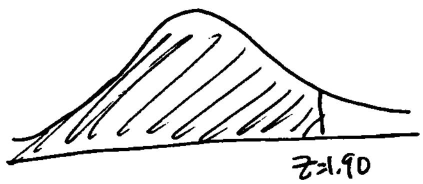


What's the Area associated with the EXACT z?

$$z = \frac{74 - 69}{2.6} = 1.923 \approx 1.92$$

↓

so it's between a $z = 1.90$ and $z = 1.95$



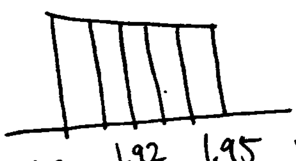
$$= 50\% + \frac{94.26}{2} = 97.130$$

$$50\% + \frac{94.88}{2} = 97.44\% =$$

$97.44 - 97.13 = .31\%$

divide this by 5 $= .062\%$

the difference close up



← each "slice" is worth .062%

so 1.92 =

$97.13 + \underbrace{.062 + .062}_{\text{2 slices}} = 97.254$

≈ 97.3%