

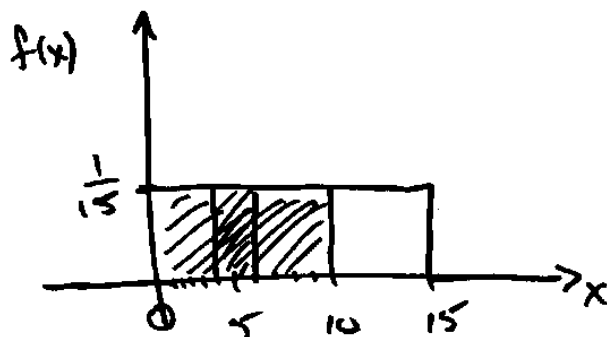
p.162

243

#50 Unit(a=0, b=15)

①

11-7



$$\mu = E(X) = \frac{a+b}{2}$$

$$\sigma^2 = V(X) = \frac{(b-a)^2}{12}$$

$$a) \mu = \frac{0+15}{2} = 7.5$$

$$\sigma^2 = \frac{(15-0)^2}{12} = 18.75$$

$$\sigma = \sqrt{18.75} = 4.33$$

$$b) P(4 < X < 6) = 2 \cdot \frac{1}{15} = .133$$

$$c) P(X < 10) = 10 \cdot \frac{1}{15} = .667$$

$$d) .95(15) = 14.25$$

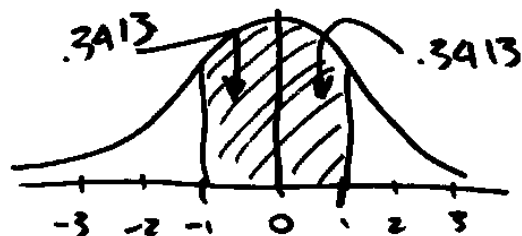
p.185

②

$$\#1 P(-1 < Z < 1)$$

$$= 2(.3913)$$

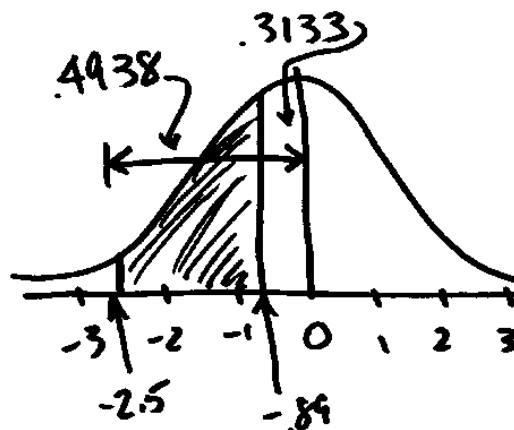
$$= .6826$$



$$3. P(-2.50 < Z < -.89)$$

$$= .4938 - .3133$$

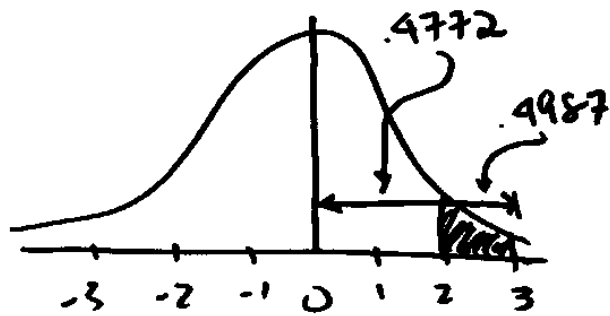
$$= .1805$$



5. $P(2 < z < 3)$

$$= .4987 - .4772$$

$$= .0215$$

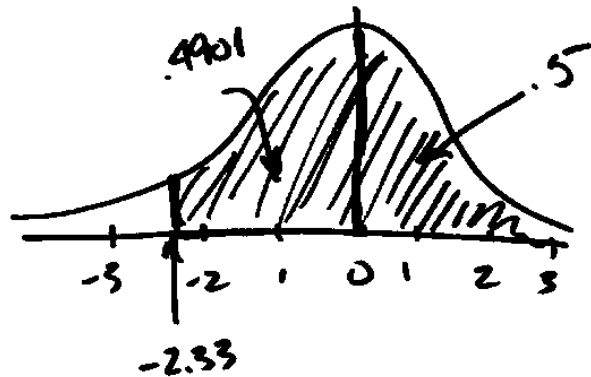


③

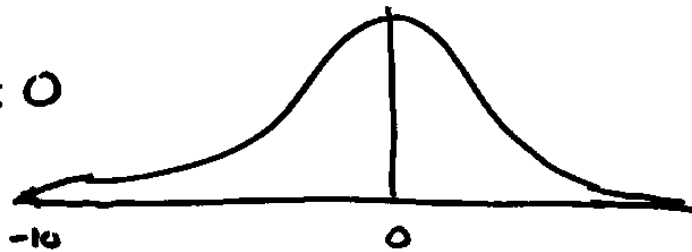
7. $P(z > -2.33)$

$$= .4901 + .5$$

$$= .9901$$



9. $P(z < -10) \approx 0$

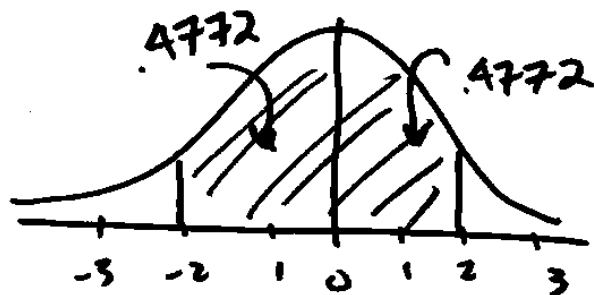


④

11. $P(-2 < z < 2)$

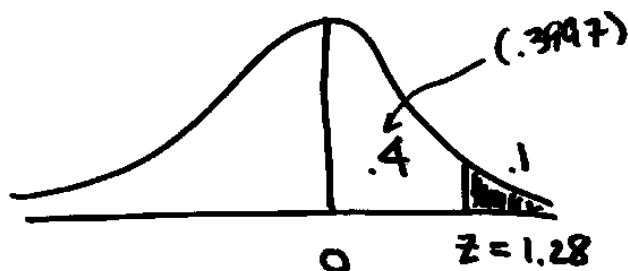
$$= 2(.4772)$$

$$= .9544$$

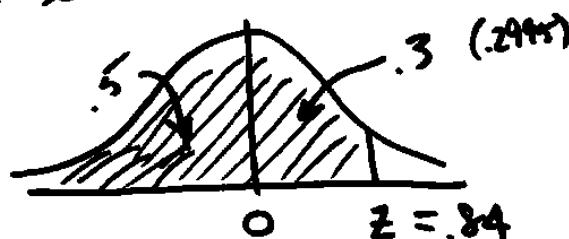


(5)

Example: Find the z-score such that the area to the right of it is 0.1.



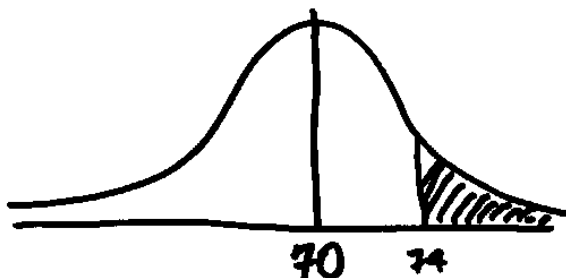
Example: Find the z-score so that the area to its left is .8



(6)

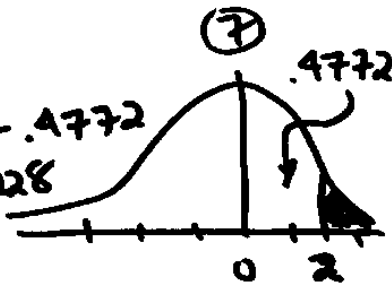
Transformations

Ex: A population of people has heights which are normally distributed with mean $\mu = 70$ " and standard deviation $\sigma = 2$ ".



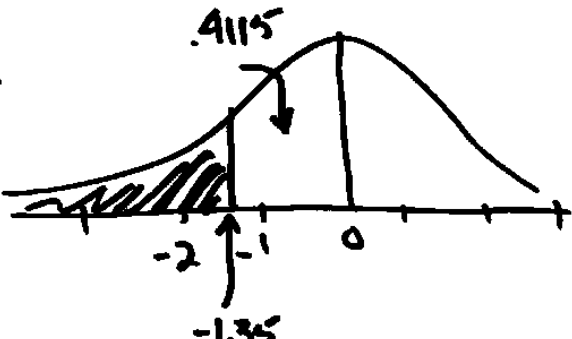
Find the probability of seeing a person taller than 74".

$$P(X > 74) = P(Z > 2) = .5 - .4772 = .0228$$

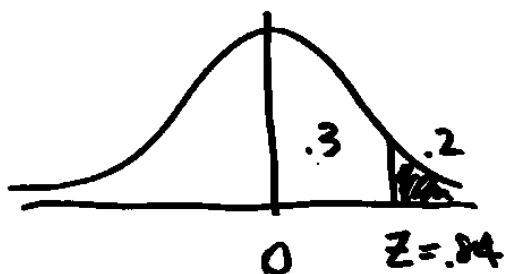
$$\frac{X - \mu}{\sigma} = Z \quad \frac{74 - 70}{2} = 2$$


Suppose that a population has a normal distribution with $\mu = 77$ and $\sigma = 20$. Find the probability of seeing a value less than 50.

$$P(X < 50) = P\left(Z < \frac{50 - 77}{20}\right) = P(Z < -1.35)$$

$$P(Z < -1.35) = .5 - .4115 = .0885$$


Same example: Find X so that the area to the right of it is .2.



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

$X = \sigma Z + \mu$

Inverse Trans.

(9)

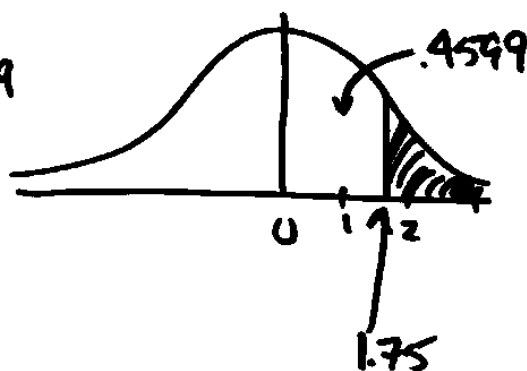
$$\begin{aligned}
 X &= 20(.84) + 77 \\
 &= 93.84
 \end{aligned}$$

Example: Suppose that auto speeds on I5 are normal with $\mu = 68$ and $\sigma = 4$.

Find the probability of see a car going faster than 75.

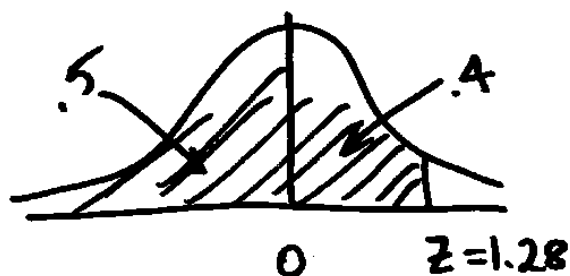
$$P(X > 75) = P\left(Z > \frac{75 - 68}{4}\right) = P(Z > 1.75)$$

$$\begin{aligned}
 P(Z > 1.75) &= .5 - .4599 \\
 &= .0401
 \end{aligned}$$



(10)

Find the 90th percentile of the speeds.



$$\begin{aligned}
 X &= \sigma z + \mu \\
 &= 4(1.28) + 68 \\
 &= \underline{\underline{73.12}}
 \end{aligned}$$

(11)

HW p. 186 # 15, 17, 19
p. 191 # 23, 31, 33
p. 196 # 43, 49

Lab 2 is due Thursday 11-9

Quiz 3: Binomial, Hypergeometric, Poisson
this Thursday
