

—Assignment 3 Sec 009
Problems from chapter 4.

4.17 Standard Normal random variable Z , &

$$\begin{aligned} (a) P(Z \geq 0.99) &= 1 - P(Z < 0.99) \\ &= 1 - 0.8389 \quad \therefore \text{from Standard normal random Variable. table} \\ &= \underline{\underline{0.1611}} \end{aligned}$$

$$\begin{aligned} (b) P(Z < -0.99) &= 0.1611 \quad (\text{from the table}) \end{aligned}$$

$$\begin{aligned} (c) P(Z < 0.99) &= 0.8399 \end{aligned}$$

$$\begin{aligned} (d) P(|Z| > 0.99) &\Rightarrow P(Z < -0.99) + P(Z > 0.99) \\ &= 0.1611 + 0.1611 \\ &= \underline{\underline{0.3222}} \end{aligned}$$

$$\begin{aligned} (e) P(Z < 10.0) &= \underline{\underline{1.00}} \quad \therefore \text{from the Standard normal table.} \end{aligned}$$

$$\begin{aligned} (f) P(Z > 10.00) &= \underline{\underline{0.00}} \end{aligned}$$

g)

9) with probability 0.9, Variable Z is less than.

$$\Rightarrow P(Z < x) = 0.9$$

$$\Rightarrow P(Z < 1.28)$$

$$\Rightarrow x = \underline{1.28}$$

4.21

The avg height of professional basketball is = 6 feet 7 inches. = 79"

Standard deviation = 3.89 inches

@ percent of professional basketball player are taller than 7 feet are = 84"

$$P(X > 84) = 1 - ((84 - 79) / 3.89)$$

$$700 = 1 - Z(1.285)$$

$$(91.12) = 1 - 0.9006$$

$$= 0.0994$$

$$\approx 9.94\%$$

⑤ If your favorite player is within the tallest 20% of all players then height is

$$P(X > h) = 0.02$$

$$1 - Z((h - 79) / 3.84) = 0.2$$

$$Z((h - 79) / 3.84) = 0.8$$

$$Z(0.85) = 0.1 \text{ (from the table)}$$

$$\Rightarrow ((h - 79) / 3.84) = 0.85$$

$$h - 79 = 3.264$$

$$h = 3.264 + 79$$

$$h = 82.264$$

$$h = \underline{6' 10''}$$

6 feet 10 inches.

4.22 \therefore Refer to the 'country' Example 4.11.1
we have $\mu = 900$ coins and $\sigma = 200$ coins.

② Assuming that x is a normal distribution random variable

Portion of the population for bottle milk is

$$P(Z < (640 - 900) / 200)$$

$$P(Z < -13.10)$$

$$P(Z < -1.3)$$

$$= 0.0968.$$

④ incomes qualifies a household to get free sandwich among 5%.

$$P(Z < (i - 900) / 200) = 0.05$$

$$(i - 900) / 200 = 1.64 \text{ (from 'z'-table)}$$

$$i - 900 = -328$$

$$i = 572 \text{ coins}$$