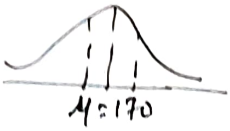
Q2

(a)



$\mu = 170$

$\sigma = 10$

$n = 1000$

for 160 to 180;

we know;

from $(\mu - \sigma)$ to $(\mu + \sigma)$ the percent distribution is 68%. from 68-95-99 rule

So,

$$\boxed{P(x=160) \text{ to } P(x=180) = 68\%} \quad \text{(a)}$$

(b) Standardize Sample mean:-

$$z = \frac{\bar{x} - \mu}{\sigma/\sqrt{n}} = \frac{175 - 170}{\text{standard error}}$$

$$= \frac{5}{10/\sqrt{100}}$$

$$= \frac{5}{1} = 5$$

from z table:- for $z = 5$

for area right of the $z = 5$ is nearly $= 0$

So, probability is nearly zero

~~(c) for P 185~~

(c) for $\cancel{X} = 185$ $\quad z = \frac{\bar{x} - \mu}{\sigma}$

$$z = \frac{185 - 170}{10}$$

$$\boxed{z = \frac{15}{10} = 1.5}$$

for $z = 1.5$ score $= \underline{0.9332}$ — (c)

(d)

we know;

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

here we have to find x;

$$x = z * \sigma + \mu. \quad \text{— (i)}$$

for $z = 5\%$.

i.e $z = 0.05$; the score is -1.645;

So, putting it in (i)

$$x = -1.645 * 10 + 170$$

$$\boxed{x = 153.55 \text{ cm.}} \text{ — (d)}$$

(e) Coeff of Variation (CV) $= \frac{\sigma}{\mu} * 100$

$$= \frac{10}{170} \times 100$$

$$= \underline{5.88\%}.$$

(f) Skewness: $(3*(\text{mean}-\text{median}))/\text{std. deviation}$

$= 3*(170-170)/10$ [mean = median since data is almost normally distributed]

$= 0$

It implies that the heights are distributed symmetrically around the mean.

--X