Central limit Theorem Assignment

Q.1.

$\mu = 10$

$\sigma = 4$

$n = 100$

$z = \dfrac{x - \mu}{\dfrac{\sigma}{\sqrt{n}}}$

Value is < 9

$$z = \dfrac{9-10}{\dfrac{4}{\sqrt{100}}} = \dfrac{-1}{\dfrac{4^2}{10^5}} = \underline{-2\cdot5}$$

in z table value $= \underline{.0062}$

Q.2

mean $\mu = 50$

$\sigma = 15$

$n = 10$

Q.3

$\mu = 2.4$

$\sigma = 2\cdot0$

$n = 100$

$\dfrac{2}{\sqrt{100}}$

Q.4

$$Z = \frac{98 - 96}{\frac{16}{\sqrt{85}}} = \frac{2}{\frac{16}{5.9}} \quad \frac{2}{2.70} = .74$$

$$= .7704$$

Q.5.

(a)
$$Z = \frac{x - \mu}{\sigma} = \frac{6.8 - 6}{1} = .2$$
$$= .5793$$

(b)
$$Z = \frac{x - \mu}{\frac{\sigma}{\sqrt{n}}} = \frac{6.2 - 6}{\frac{1}{\sqrt{100}}} = .2 \times 10 = 2$$
$$.9772$$

Q.6 =

$$Z = \frac{x - \mu}{\frac{\sigma}{\sqrt{n}}} = \frac{6.2 - 6}{\frac{1}{\sqrt{100}}} = .9772$$

If we do the more the 60-% of the men
will not be included.

Q.7.
$n = 25$
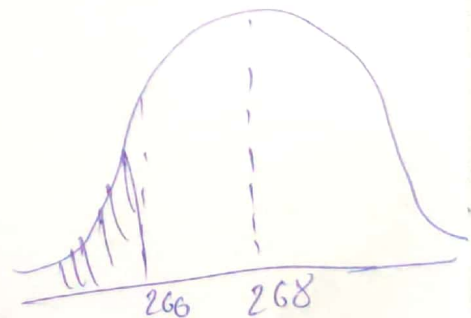$\sigma = 15$
$\mu = 260$

$$Z_{sn} = \frac{260 - 268}{\frac{15}{\sqrt{25}}} = \frac{-8 \, 2}{\frac{15 \, 3}{8}} = \bigcirc$$

-2.66

$= .0039$

266   268

Q.8 from above observation we can say that .0039 is less than 1%. So 260 days fan meen is is unusually low. So it does affect the health.
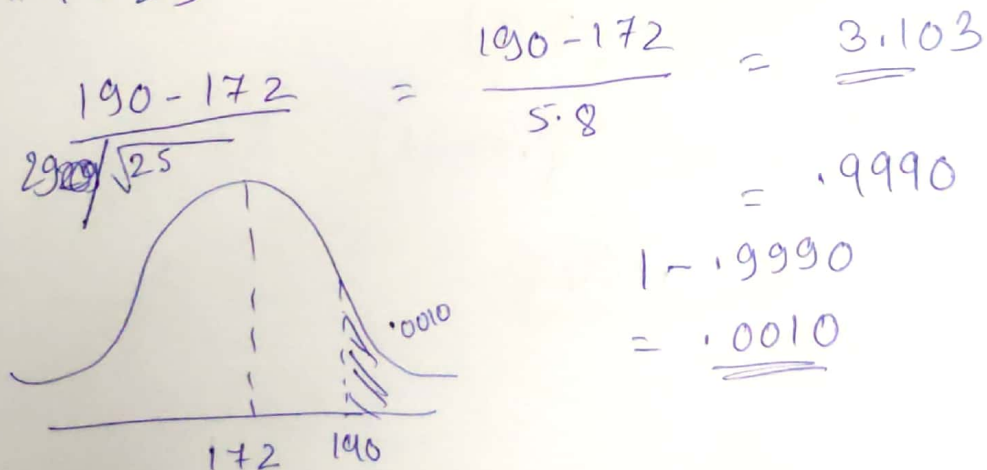
Q.9 $\mu = 172$

$\sigma = 29$

(a) $z = \dfrac{190 - 172}{29} = .621 = z \text{ table} = .7324$

it says. one randomly select

~~z table = .267~~ ∴ $1 - .7324$

$= .2673$

(b) $n = 25$

$\dfrac{190 - 172}{29/\sqrt{25}} = \dfrac{190 - 172}{5.8} = 3.103$

$= .9990$

$1 - .9990$

$= .0010$

172 190

.0010

(c) mean. $\dfrac{4750}{25} = 190$

P(

Q. 10

$\mu = 4.0$

$\sigma = 1.5$

$n = 50$

3.4   3.6   3.8   4   4.2   4.4   4.6
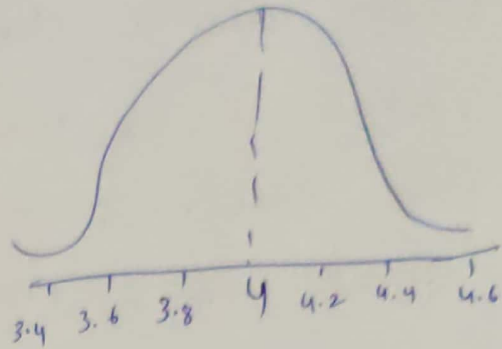
$$\frac{\sigma}{\sqrt{n}} = \frac{1.5}{\sqrt{50}} = .2121$$

if 3.5 & 3.8

$$P \left(\frac{3.5 - 4.0}{.2121} \right) \Bigg| P \left(\frac{3.8 - 4.0}{.2121} \right)$$

$-.94$ -2.36

so if between 3.5 & 3.8

the $(-.94) - (-2.36)$

$= (.1736) - (.0091)$

$= .1645$

Q. 11

$$\mu = 23.1$$
$$\sigma = 3.1$$
$$n = 6$$
$$x = 27$$

$$Z = \frac{27 - 23.1}{\frac{3.1}{\sqrt{6}}} = 3.08$$

$$1 - .9990 = .0010$$

Q.12

$$\mu = 21.50$$
$$\sigma = 2.22$$
$$n = 8$$

$$Z_1 = \frac{20 - 21.50}{\frac{2.22}{\sqrt{8}}} = \frac{-1.5}{.78} = -1.92$$

$$= .0274$$

$$Z_2 = \frac{23 - 21.50}{.78} = \frac{1.5}{.78} = 1.92$$

$$= .9726$$

$$Z_1 - Z_2 = .9726 + .0274$$

$$= .9998$$

Q.13

$\mu = 75$

$\sigma = 5$

(a) $Z = \dfrac{83 - 75}{5} = 1.6$

$Z = .9452$

$P = 1 - Z$

$= 1 - .9452$

$= .0548$

(b) $\dfrac{83 - 75}{5/\sqrt{5}} = \dfrac{83 - 75}{2.23} = 3.57$

$Z = .9999$

$P = 1 - Z$

$= 1 - .9999$

$= .0001$

Q·14

$\mu = 28.3$

$\sigma = 2.3$

$n = 10$

$x = 27$

$\therefore \quad \dfrac{27 - 28.3}{\dfrac{2.3}{\sqrt{10}}} = \dfrac{-1.3}{.727} = 1.788$

$Z = .0375$