NORMAL DISTRIBUTION

X : gestation periods

$$X \sim N(275, 4^2)$$

VARIANCE $= 16 = 4^2$

Questions

1) $P(X \geqslant 280)$

Z score

$$Z_0 = \frac{x_0 - \mu}{\sigma} = \frac{280 - 275}{4}$$

$$= \frac{5}{4} = 1.25$$

From table $P(Z \geqslant 1.25) = 0.1056$

$\therefore P(X \geqslant 280) = 0.1056$

11) $P(X \leqslant 268)$

Z score $= \frac{x_0 - \mu}{\sigma} = \frac{268 - 275}{4}$

$$= -7/4 = -1.75$$

$$P(Z \leq -1.75) = P(Z \geq 1.75)$$

Symmetry Rule

$$P(X \leq 268) = P(Z \geq 1.75)$$

$$= 0.0401$$

from MUROOCH BARNES table 3

iii) $P(272 \leq X \leq 283)$ interval

$$= 1 - \left[P(X \leq 272) + P(X \geq 283) \right]$$

          TOO LOW   TOO HIGH

$P(X \leq 272)$

Z score : $z_0 = \dfrac{x_0 - \mu}{\sigma} = \dfrac{272 - 275}{4}$

$$= -0.75$$

$$P(Z \leq -0.75) = P(Z \geq 0.75)$$

Symmetry Rule

$$P(X \leq 272) = P(Z \geq 0.75)$$

$$= 0.2266$$

(From tables).

- $P(X \geq 283)$

Z score $= 2$.

$$P(Z \geq 2) = 0.02275$$

$$\therefore \quad P(X \geq 283) = 0.02275$$

Put it altogether

$$P(272 \leq X \leq 283)$$

$$= 1 - [0.2266 + 0.02275]$$

$$= 1 - 0.2494 \quad (ROUNDED)$$

$$= 0.7506$$

iv) FIND A value x_0 such that (4)

$$P(X \geq x_0) = 0.025$$

Check murdoch barnes tables
TO find z_0 such that

$$P(Z \geq z_0) = 0.025$$

[or AS close ASyou can get]

	0.06
1.9	0.0250

$$z_0 = 1.96$$

$$1.96 = \frac{x_0 - 275}{4} \quad \leftarrow \text{Z Score formula}$$

$$7.84 = x_0 - 275$$

$$x_0 = 282.84$$