7: The random variable X is such that $X \sim \mathrm{N}(\mu, \sigma^2)$

The mean of a random sample of n observations of X is denoted by $\bar{X}_n$

Given that

$$\mathrm{P}(\bar{X}_n < 45.2) = 0.3446 \text{ and } \mathrm{P}(\bar{X}_n > 75.2) = 0.0179$$

and using the statistical tables provided,

(a) show that $\sigma = 12\sqrt{n}$

(6)

(b) Hence, find the value of μ

(2)

(c) Find $\mathrm{P}(\bar{X}_n > 59)$

(3)

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Question 7 continued

(Total for Question 7 is 11 marks)