

L3–STATMF

See back cover for an English
translation of this cover

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Mana Tohu Mātauranga o Aotearoa
New Zealand Qualifications Authority



Te Pāngarau me te Tauanga (Te Tauanga), Kaupae 3, 2023

TE PUKA MŌ NGĀ TURE TĀTAI ME NGĀ TŪTOHI
mō te 91584M, te 91585M, me te 91586M

Tirohia tēnei puka hei whakaoti i ngā tūmahi i ō Pukapuka Tūmahi.

Tirohia kia kitea ai e tika ana te raupapa o ngā whārangi 2–7, ka mutu, kāore tētahi o aua whārangi i te takoto kau.

E ĀHEI ANA TŌ PUPURI I TĒNEI PUKAPUKA HEI TE MUTUNGA O TE WHAKAMĀTAUTAU.

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Kāore e whakaaetia ana kia tāruahia tētahi paku wāhanga o tēnei whakamātautau ki te kore te Mana Tohu Mātauranga e mātua whakaae.

TE PĀNGARAU ME TE TAUANGA (TAUANGA) – HE TURE TĀTAI ME NGĀ TŪTOHI E WHAIHUA ANA

Ngā Whiringa Raupapa me ngā Whiringa Raupapa-kore

$${}^n P_r = \frac{n!}{(n-r)!}$$

$$\binom{n}{r} = {}^n C_r = \frac{n!}{(n-r)! r!}$$

Te Taurangi Pūmau

$$E[aX + b] = aE[X] + b$$

$$\text{Var}[aX + b] = a^2 \text{Var}[X]$$

$$E[aX + bY] = aE[X] + bE[Y]$$

$$\text{Var}[aX + bY] = a^2 \text{Var}[X] + b^2 \text{Var}[Y]$$

mēnā kei te motuhake te X, Y

Te Tūponotanga

$$P(A \cup B) = P(A) + P(B) - P(A \cap B)$$

$$P(A|B) = \frac{P(A \cap B)}{P(B)}$$

Te Toharite me te Rerekētanga o te Taurangi Motumotu Matapōkere

$$\begin{aligned} \mu &= E(X) & \sigma^2 &= \text{Var}(X) \\ &= \sum x.P(X=x) & \sigma &= \text{SD}(X) \\ & & &= \sqrt{\sum (x-\mu)^2.P(X=x)} \\ & & &= \sqrt{E(X^2) - [E(X)]^2} \end{aligned}$$

Te Tuari Motukore Ōrite

E tautohua ana te pānga kiato tūponotanga, $f(x)$, mō te tuari motukore ōrite hei:

$$f(x) = \begin{cases} \frac{1}{b-a} & \text{mō } a \leq x \leq b \\ 0 & \text{i wāhi kē} \end{cases}$$

MATHEMATICS AND STATISTICS (STATISTICS) – USEFUL FORMULAE AND TABLES

Permutations and Combinations

$${}^n P_r = \frac{n!}{(n-r)!}$$

$$\binom{n}{r} = {}^n C_r = \frac{n!}{(n-r)! r!}$$

Expectation Algebra

$$E[aX + b] = aE[X] + b$$

$$\text{Var}[aX + b] = a^2 \text{Var}[X]$$

$$E[aX + bY] = aE[X] + bE[Y]$$

$$\text{Var}[aX + bY] = a^2 \text{Var}[X] + b^2 \text{Var}[Y]$$

if X, Y are independent

Probability

$$P(A \cup B) = P(A) + P(B) - P(A \cap B)$$

$$P(A|B) = \frac{P(A \cap B)}{P(B)}$$

Mean and Variance of a Discrete Random Variable

$$\mu = E(X)$$

$$= \sum x.P(X = x)$$

$$\sigma^2 = \text{Var}(X)$$

$$\sigma = \text{SD}(X)$$

$$= \sqrt{\sum (x - \mu)^2 . P(X = x)}$$

$$= \sqrt{E(X^2) - [E(X)]^2}$$

Continuous Uniform Distribution

The probability density function, $f(x)$, for a continuous uniform distribution is defined as:

$$f(x) = \begin{cases} \frac{1}{b-a} & \text{for } a \leq x \leq b \\ 0 & \text{elsewhere} \end{cases}$$

English translation of the wording on the front cover

Level 3 Mathematics and Statistics (Statistics) 2023

FORMULAE AND TABLES BOOKLET for 91584M, 91585M, and 91586M

Refer to this booklet to answer the questions in your Question and Answer booklets.

Check that this booklet has pages 2–7 in the correct order and that none of these pages is blank.

YOU MAY KEEP THIS BOOKLET AT THE END OF THE EXAMINATION.