



NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

QUALIFY FOR THE FUTURE WORLD
KIA NOHO TAKATŪ KI TŌ ĀMUA AO!

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Te Pāngarau me te Tauanga (Tauanga), Kaupae 3, 2015

2.00 i te ahiahi Rāpare 19 Whiringa-ā-rangi 2015

TE PUKAPUKA O NGĀ TIKANGA TĀTAI ME NGĀ TŪTOHI
mō 91584M, 91585M me 91586M

Tirohia tēnei pukapuka hei whakatutuki i ngā tūmahi o ō pukapuka Tuhinga, Tūmahi hoki.

Tirohia mēnā e tika ana te raupapatanga o ngā whārangi 2–7 kei roto i tēnei pukapuka, ka mutu, kāore tētahi o aua whārangi i te takoto kau.

KA TAEA TĒNEI PUKAPUKA TE PUPURI HEI TE MUTUNGA O TE WHAKAMĀTAUTAU.

TE PĀNGARAU ME TE TAUANGA (TAUANGA) – ĒTAHI TIKANGA TĀTAI ME ĒTAHI TŪTOHI WHAITAKE

Ngā Whiriwhiringa Raupapa me ngā Whiriwhiringa Raupapa Kore

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

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

Taurangi Whakapae

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

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

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

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

mēnā he wehe kē te X me te Y

Tūponotanga

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

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

Te Tau Toharite me te Taurangitanga o tētahi Taurangi Matapōkere

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

Tuaritanga Ōrite Motukore

Ko te pānga kiato tūponotanga, $f(x)$, mō tētahi tuaritanga ōrite motukore, ko:

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

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

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

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), 2015

2.00 p.m. Thursday 19 November 2015

FORMULAE AND TABLES BOOKLET for 91584, 91585 and 91586

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.