2.8 Statistics: Distributions Depth: 10-minute Pack

EDEXCEL 9MA0 · Calculator allowed · about 10 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

A-Level Statistics: Distributions - Depth Practice

Original material written for Revision Library, styled on Edexcel AS/A-level Mathematics (9MA0) Statistics content.

This pack extends core statistical distributions work to full A-level depth: discrete random variables (probability distributions, cumulative distribution functions, E(X), Var(X) and linear transformations), the binomial distribution (conditions, probabilities, mean and variance, cumulative probabilities), the normal distribution (standardising, inverse normal problems, finding unknown parameters), the sum of independent normal variables, and using the normal distribution to approximate the binomial distribution with a continuity correction. All contexts and figures are original.

1 A biased coin is such that the probability of obtaining a head on any throw is 0.3. The coin is thrown 10 times, with each throw independent of the others. Let Y be the number of heads obtained.

(a) Write down the distribution of Y, stating the value(s) of any parameter(s). **(1)**

(b) Find P(Y = 3), giving your answer to 3 significant figures. **(2)**

(c) Find P(Y ≥ 5). **(3)**

(Total for Question 1 is 6 marks)

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Mark scheme · 2.8 Statistics: Distributions Depth: 10-minute Pack

Question 1

(a) Y ~ B(10, 0.3) stated	**B1**
(a) Answer: Y ~ B(10, 0.3)	
(b) correct expression C(10,3) * 0.3^3 * 0.7^7 (oe)	**M1**
(b) awrt 0.267	**A1**
(b) Answer: P(Y = 3) = awrt 0.267	
(c) use of P(Y≥5) = 1 - P(Y≤4) (oe)	**M1**
(c) correct computation of P(Y≤4) (sum of P(0) to P(4), or calculator cdf), e.g. awrt 0.850	**M1**
(c) awrt 0.150	**A1**
(c) Answer: P(Y ≥ 5) = awrt 0.150	

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