The negative binomial distribution

Answers

Further Maths topic practice

This topic online

Q	Answer	Marks
1	**a)** 0.0742 **b)** E(X) = 12, Var(X) = 36	4
2	**a)** 0.2161 **b)** Throws independent; probability of scoring constant at 0.7	4
3	**a)** 0.0080 **b)** mean 125, sd 54.8	5
4	**a)** S ≤ 8 exactly when at least 5 of the first 8 seeds germinate **b)** 0.5941 **c)** 0.1662	7
5	**a)** r = 3, p = 1/4 **b)** 0.1035	6
6	**a)** 0.2 **b)** $10p^2 + p - 1 > 0$ (shown) **c)** $0.270 < p \leq 1$	7
7	**a)** NB(3, 0.3), the number of attempts up to and including the 3rd success **b)** 0.0926 **c)** E(Y) = 10, Var(Y) = 70/3 = 23.3 **d)** 0.1323	8
8	P(win A) = P(X ≤ 5) for X ~ NB(3, 0.45) = 0.4069; P(win B) = $1 - 0.75^3$ = 0.5781; so challenge B gives the greater probability.	7
9	**a)** 0.0257 **b)** 0.1937 **c)** 3/13 (shown)	8
10	**a)** -£2 **b)** 0.4233 **c)** 0.2336 **d)** £10	8
11	**a)** 0.7x/(x - 3) (shown) **b)** 10 and 11 **c)** 0.0800	8
12	**a)** ½r(r - 15) (shown) **b)** 16 **c)** £13.86 **d)** 0.6093	11

Full worked solutions, written out by hand, are on the solutions sheet for this topic.

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