# Linear transformations and the discrete uniform distribution

Answers

**Further Maths topic practice**

This topic online

| Q | Answer | Marks |
|---|---|---|
| 1 | **a)** 10 **b)** 22.5 **c)** 10 | 3 |
| 2 | **a)** discrete uniform distribution (on 1, 2, ..., 12) **b)** E(X) = 6.5, Var(X) = $\frac{143}{12}$ (11.9) **c)** $\frac{1}{3}$ | 4 |
| 3 | **a)** E(X) = 1.9, Var(X) = 0.49 **b)** E(Y) = 6.8, Var(Y) = 1.96 | 5 |
| 4 | mean 162 g, standard deviation 6 g | 4 |
| 5 | **a)** 11 **b)** 6 **c)** $\frac{4}{11}$ | 5 |
| 6 | **a)** E(S) = 12, Var(S) = 33 **b)** 0.6 | 6 |
| 7 | **a)** E(X) = 5, Var(X) = $\frac{80}{12} = \frac{20}{3}$ **b)** a = 3, b = -3 | 6 |
| 8 | **a)** 70p **b)** 30p **c)** 34.2p **d)** 117 | 7 |
| 9 | **a)** 20 **b)** E(X) = 10.5, Var(X) = 33.25 **c)** E(Y) = 40, Var(Y) = 532 | 6 |
| 10 | **a)** a = 0.1, b = 0.5 **b)** 7.2 **c)** -1 | 7 |
| 11 | **a)** E(X) = (n + 1)/2 and Var(X) = $(n^2 - 1)/12$, as shown **b)** E(T) = 20.5, Var(T) = 33.25 **c)** $\frac{1}{4}$ | 9 |
| 12 | **a)** 3E(X) - 2 = 13 gives E(X) = 5 = (n + 1)/2, so n = 9 **b)** 60 **c)** £30 **d)** 38.7p **e)** $\frac{4}{9}$ | 9 |

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


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