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4. The random variable W has a discrete uniform distribution where

$$P(W = w) = \frac{1}{5} \quad \text{for } w = 1, 2, 3, 4, 5$$

(a) Find $P(2 \leqslant W < 3.5)$

(1)

The discrete random variable $X = 5 - 2W$

(b) Find $E(X)$

(3)

(c) Find $P(X < W)$

(2)

The discrete random variable $Y = \frac{1}{W}$

(d) Find

(i) the probability distribution of Y

(ii) $Var(Y)$, showing your working.

(5)

(e) Find $Var(2 - 3Y)$

(2)

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Question 4 continued

(Total 13 marks)

Q4