4. The discrete random variable X has the following probability distribution.

x	1	2	3	4
$P(X = x)$	$\frac{1}{10}$	$\frac{1}{5}$	$\frac{3}{10}$	$\frac{2}{5}$

(a) Show that $E\left(\frac{1}{X}\right) = \frac{2}{5}$

(1)

(b) Find $\text{Var}\left(\frac{1}{X}\right)$

(3)

The random variable $Y = \frac{30}{X}$

(c) Find

(i) $E(Y)$

(ii) $\text{Var}(Y)$

(3)

(d) Find $P(X < 3 \mid Y < 20)$

(5)

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Question 4 continued

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Question 4 continued

(Total for Question 4 is 12 marks)