1. Jen has one fair 4-sided red die and one fair 4-sided blue die.

- The red die has sides numbered 1, 2, 3 and 4
- The blue die has sides numbered 1, 3, 5 and 7

The discrete random variable R represents the score from one roll of the red die.

The discrete random variable B represents the score from one roll of the blue die.

(a) Write down the name of the distribution of R

(1)

(b) Find $P(R < 3)$

(1)

(c) Write down the value of

(i) $E(R)$

(ii) $E(B)$

(2)

(d) Showing your working, find $Var(B)$

(3)

Jen rolls each die once.

(e) Find $P(R + B \leqslant 5)$

(2)

(f) Find $P(R^2 < B)$

(3)

The random variable D is defined as the magnitude of the difference between the score on the red die and the score on the blue die.

The table below shows the cumulative distribution function of D

d	0	1	2	3	4	5	6
$F(d)$	$\frac{1}{8}$	$\frac{3}{8}$	$\frac{9}{16}$	$\frac{3}{4}$	p	$\frac{15}{16}$	1

(g) Showing your working, find the value of p

(3)

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Question 1 continued

(Total for Question 1 is 15 marks)