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6. The random variable A represents the score when a spinner is spun. The probability distribution for A is given in the following table.

a	1	4	5	7
$P(A = a)$	0.40	0.20	0.25	0.15

(a) Show that $E(A) = 3.5$

(2)

(b) Find $\text{Var}(A)$

(3)

The random variable B represents the score on a 4-sided die. The probability distribution for B is given in the following table where k is a positive integer.

b	1	3	4	k
$P(B = b)$	0.25	0.25	0.25	0.25

(c) Write down the name of the probability distribution of B.

(1)

(d) Given that $E(B) = E(A)$ state, giving a reason, the value of k.

(1)

The random variable $X \sim N(\mu, \sigma^2)$

Sam and Tim are playing a game with the spinner and the die.

They each spin the spinner once to obtain their value of A and each roll the die once to obtain their value of B.
Their value of A is taken as their value of μ and their value of B is taken as their value of σ.
The person with the larger value of $P(X > 3.5)$ is the winner.

(e) Given that Sam obtained values of $a = 4$ and $b = 3$ and Tim obtained $b = 4$ find, giving a reason, the probability that Tim wins.

(2)

(f) Find the largest value of $P(X > 3.5)$ achievable in this game.

(4)

(g) Find the probability of achieving this value.

(2)

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TOTAL FOR PAPER: 75 MARKS

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