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#Jenny



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Cool! I'am really happy

#Markus Jensen



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#Diego Butler



so many fake sites. this is the first one which worked! Many thanks

Question Number	Scheme	Marks												
2.(a)	$p + q + 0.2 + 0.3 + p = 1$ i.e. $2p + q = 0.5$ (o.e.)	B1												
(b)	$E(X) = -2p - q + \frac{1}{2}(0.2 + \frac{1}{2}) + 0.3 + 2p$ [o.e.] i.e. $-q + 0.1 + 0.45$ [o.e.] $q = 0.15$	M1A1 A1												
(c)	$2p + 0.15 = 0.5$ (o.e.) $p = 0.175$	M1 A1												
(d)	$[Var(X)] = 2.275 - (0.4)^2$ $= 2.115$ (Accept 2.12)	M1 A1												
(e)	<table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td><math>r</math></td> <td><math>-\frac{1}{2}</math></td> <td><math>-1</math></td> <td><math>2</math></td> <td><math>\frac{1}{2}</math></td> <td><math>\frac{1}{2}</math></td> </tr> <tr> <td><math>P(R=r)</math></td> <td><math>p</math></td> <td><math>q</math></td> <td><math>0.2</math></td> <td><math>0.3</math></td> <td><math>p</math></td> </tr> </table> $E(R) = -\frac{1}{2}p - q + 0.4 + 0.2 + 1p$ $= 0.6 - q = 0.45$ (or $\frac{9}{20}$ )	$r$	$-\frac{1}{2}$	$-1$	$2$	$\frac{1}{2}$	$\frac{1}{2}$	$P(R=r)$	$p$	$q$	$0.2$	$0.3$	$p$	M1 dM1 A1B
$r$	$-\frac{1}{2}$	$-1$	$2$	$\frac{1}{2}$	$\frac{1}{2}$									
$P(R=r)$	$p$	$q$	$0.2$	$0.3$	$p$									
(f)(i)	$S > R$ when $s = 1.5$ and 2 $P(\text{Sarah wins}) = 0.3 + p = 0.475$ (or $\frac{19}{40}$ )	M1 A1B												
(ii)	$R > S$ when $s = -2$ and $\frac{1}{2}$ or $s = -\frac{1}{2}$ and 2 $P(\text{Rebecca wins}) = 0.2 + p = 0.375$ (or $\frac{3}{8}$ )	M1 A1B												
		(4)												
		[15 marks]												
Notes														
(a)	B1 for any correct equation based on sums of probs. = 1 Correct answer only in (b), (c), (d), (e) or (f) scores full marks for that part.													
(b)	M1 for an attempt at an expression based on $E(X)$ . At most 2 errors or omissions. 1 <sup>st</sup> A1 for a correct equation. [May be implied by a correct answer] 2 <sup>nd</sup> A1 for $q = 0.15$ or exact equivalent e.g. $\frac{3}{20}$													
(c)	M1 for correct equation or using their equation from (a) with their $q$ , provided $q \in [0, 1]$ A1 for $p = 0.175$ or exact equivalent e.g. $\frac{7}{40}$													
(d)	M1 for a correct numerical expression but M0 if followed by division by $k$ (e.g. $k = 5$ ) A1 for 2.115 or accept errat 2.12 (also accept exact equivalent e.g. $\frac{423}{200}$ )													
(e)	1 <sup>st</sup> M1 for correct values for $R$ , allow 1 error, and allow un-simplified. Condense no label if not used as probabilities. If seen in table on QP allow, but must be labelled. Just writing the sum $\Sigma r$ is M0 but adding later can score 1 <sup>st</sup> M1													
(f)	2 <sup>nd</sup> dM1 dependent on 1 <sup>st</sup> M1. For an attempt at an expression based on $E(R)$ , ft $p$ and $q$ (if probabilities) ft their $r$ values. At least 3 correct (or correct B) products seen for 0.45 or (0.6 - their $q$ ) provided $q$ is a probability. Answers for (f) must be clearly labelled or take 1 <sup>st</sup> as (i) and 2 <sup>nd</sup> as (ii)													
(f)(i)	M1 for identifying the correct values of $X$ A1B for 0.475 or 0.3 + their $p$ , provided answer is a probability													
(f)(ii)	M1 for identifying the correct values of $X$ or $R$ A1B for 0.375 or 0.2 + their $p$ or 1 - their 0.475 - their $q$ , provided ans. is a probability													
SC1, N1, N2	They use two values of $X$ : (i) for $P(S > R) = 0.445$ (B1) (ii) for $P(R > S) = 0.4625$ (B1). No ft													
SC2 on map	Answers wrong way round: (i) $P(S > R) = 0.375$ and (ii) $P(R > S) = 0.475$ (B1)													
Flags	On open record SC1 as (i), M0A1, (ii) M0A1, and SC2 as M0A0M0A1	No ft												

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