

Mark Scheme (Results)

January 2017

Pearson Edexcel International A Level Mathematics

Statistics 1 (WST01)





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General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

EDEXCEL IAL MATHEMATICS

General Instructions for Marking

- 1. The total number of marks for the paper is 75.
- 2. The Edexcel Mathematics mark schemes use the following types of marks:
- M marks: method marks are awarded for `knowing a method and attempting to apply it', unless otherwise indicated.
- A marks: Accuracy marks can only be awarded if the relevant method (M) marks have been earned.
- B marks are unconditional accuracy marks (independent of M marks)
- Marks should not be subdivided.
- 3. Abbreviations

These are some of the traditional marking abbreviations that will appear in the mark schemes.

- bod benefit of doubt
- ft follow through
- the symbol $\sqrt[4]$ will be used for correct ft
- cao correct answer only
- cso correct solution only. There must be no errors in this part of the question to obtain this mark
- isw ignore subsequent working
- awrt answers which round to
- SC: special case
- oe or equivalent (and appropriate)
- dep dependent
- indep independent
- dp decimal places
- sf significant figures
- * The answer is printed on the paper
- The second mark is dependent on gaining the first mark
- 4. All A marks are 'correct answer only' (cao.), unless shown, for example, as A1 ft to indicate that previous wrong working is to be followed through. After a misread however, the subsequent A marks affected are treated as A ft, but manifestly absurd answers should never be awarded A marks.
- 5. For misreading which does not alter the character of a question or materially simplify it, deduct two from any A or B marks gained, in that part of the question affected.

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- 6. If a candidate makes more than one attempt at any question:If all but one attempt is crossed out, mark the attempt which is NOT crossed out.
 - If either all attempts are crossed out or none are crossed out, mark all the attempts and score the highest single attempt.
- 7. Ignore wrong working or incorrect statements following a correct answer.

January 2017 WST01 Mark Scheme			
Question Number	Scheme	Marks	
1. (a)	25 small sq' = 5 tomatoes <u>or</u> 1 large square = 5 tomatoes <u>or</u> fd=5 for $2\sim3$	M1	
	$\underline{\text{or}} = \frac{5}{25} \times 20$ $\underline{\text{or}} = 5 \times 0.8$ $\underline{\text{or}} = 2 \times 2$		
	23 = 4	A1	
	-	(2)	
(b)	$100 - (5 + 4')$ or $16 + 32 + 25 + 10 + 8$, so probability = $\frac{91}{100}$ (condone 91%)	M1, <u>A1</u> (2)	
(c)	$\frac{(7-6.25)\times16+25+10+8}{100} \text{or} 1-\frac{(a)+5+16+(6.25-5)\times16}{100} = \frac{55}{100}$	M1, <u>A1</u> (2)	
(-)	100 - 100 100	(2)	
(d)	Since '0.55' > 0.5 (or equivalent reason) and state median > 6.25	B1	
		(1)	
(e)	Median > mean, so negative skew	B1	
(f)	24	(1) M1, <u>A1</u>	
	Freq. for $(5.5 < \text{weight} < 7) = (7-5.5) \times '16' \text{ or } \frac{3}{4} \times '32', \text{ probability} = \frac{-1}{100}$		
	P (both weigh between 5.5 and 7) = $\frac{24}{23} \times \frac{23}{23} = \frac{46}{23}$ (o.e.) or awrt 0.056	M1 A1	
	$100^{\circ}99^{\circ}825^{\circ}$	(4)	
	Notes	[12 marks]	
	A correct answer with no working scores M1A1 in parts (a)~(c))	
(a)	M1 for a correct: statement linking area with frequency <u>or</u> calculation <u>or</u> at lea	st 2 values	
	on the fd scale on axis <u>or</u> at least 2 frequencies on/in histogram bars.	istogram). If	
	answers on both diagram and script contradict, the script has preference.	6)	
	M1 for $100 - (5 + (a))$ ft $0 < (their (a)) < 10$ or for a correct method for fir	ding the sum	
(b)	of the areas of all the bars above 3 (condone one slip if 5 terms seen)		
(c)	M1 fully correct expression (possibly ft their (a)) and need division by 100 (o.e.)		
	$11 \text{ for } \frac{11}{1000000000000000000000000000000000$		
	20 20 20		
(d)	B1 for $Q_2 > 6.25$ with reason based on (c) where $0.5 <$ 'their (c)' < 1 [comparison of "55" & 50]		
(e)	B1 for stating "median > mean" and "negative skew" (independent of (d))		
(f)	1 st M1 for method to find the frequency between 5.5 and 7 (Implied by the 24 used)		
	e.g. $(4+5+16+16\times2) - (4+5+16+16\times0.5) = 57-33$ based on $(\leq 7) - (\leq 5.5)$		
	$1^{\text{st}} \text{A1 for } \frac{24}{100}$ (o.e.)		
	2^{nd} M1 for $\frac{'24'}{100} \times \frac{'24'-1}{99}$ ft their 24 but must have numerator < denominator of 100×99		
	2 nd A1 for $\frac{46}{825}$ (o.e.) or awrt 0.056 NB $\frac{24}{100} \times \frac{24}{100}$ scores M1A1M0A0 [0.057	76 alone 0/4]	

Question Number	Scheme	Marks
2. (a)	(The event that) the integer selected is <u>prime</u> <u>and</u> <u>ends in a 3</u> (and is between 1 and 50 inclusive)	B1
(b)	$\frac{15}{50}$ (or equivalent e.g. 0.30) [condone 30%]	(1) B1 (1)
(c)	$\frac{12}{50}$ (or equivalent e.g. 0.24) [condone 24%]	B1 (1)
(d)	$\left[P(A C) = \right] \frac{P(A \cap C)}{P(C)} = \frac{\frac{7}{50}}{\frac{30}{50}} =, \frac{7}{\underline{30}}$	M1, <u>A1</u> (2)
(e)	$\frac{15}{50} \neq \frac{7}{30}$, so not independent.	M1, A1 (2)
(f)	$\left[P(B (A \cap C)) = \right] \frac{P(B \cap A \cap C)}{P(A \cap C)} = \frac{\frac{2}{50}}{\frac{7}{50}} =, \frac{2}{\frac{7}{50}}$	M1, <u>A1</u> (2)
		[9 marks]
(d)	M1 for a correct ratio expression (may be in words) with at least one correct pr	obbility
(e) SC	substituted or correct ratio expression and $\frac{7}{n}$ or $\frac{m}{30}$ where $7 < n$ or $m < 30$ or fully correct ratio of probabilities. A1 for $\frac{7}{30}$ or any exact equivalent e.g. 0.23 but 0.233 is M1A0 (Correct ans only = M1A1) M1 for correctly comparing 'their (b)' with 'their (d)', can be in words or symbols e.g. $P(A) \neq P(A \mid C)$ in symbols. A1 dependent on a correct (b) and (d) (or awrt 0.233 in (d)) and for concluding <u>not</u> independent For a correct test using correctly labelled $P(A) = \frac{15}{50}$, $P(C) = \frac{30}{50}$ and $P(A \cap C) = \frac{7}{50}$ with all correct probabilities and $\frac{15}{50} \times \frac{30}{50} = \frac{9}{50} \neq \frac{7}{50}$ (e.e.) even leading to	
	"not independent" score M0A1 (0.e.) seen leading to	
(f)	M1 for a correct ratio expression (may be in words) with at least one correct pro- substituted or correct ratio expression and $\frac{r}{7}$ or $\frac{2}{t}$ where $r < 7$ or $2 < t$ or fully correct ratio of probabilities A1 for $\frac{2}{7}$ or an exact equivalent. Allow awrt 0.286 here as well.(Correct ans. c	obability only = M1A1)

Question	Scheme	Marks
Number	27 62.08	D1 M1
5. (a)	$[\overline{y} =] \frac{-2.7}{12} = -2.25, Var(Y) = \frac{-02.98}{12} - (-2.25)^2$	$\underline{\mathbf{D1}}, \mathbf{W11}$
	$= 0.1858333 (allow \frac{223}{1200})$ <u>awrt 0.186</u>	A1 (3)
(b)(i)	$S_{xy} = -1190.7 - \frac{(504)(-27)}{12}$ or -56.7	B1
	$r = \frac{'-56.7'}{\sqrt{(1674)(2.23)}} =, -0.9280105$ <u>awrt - 0.928</u>	M1, A1
(ii)	Negative correlation, so Priya's belief is incorrect.	B1 (4)
(c)	$b = \frac{-56.7}{1674} \ [= -0.033870]$	M1
	$\frac{-27}{12} = a + b' \times \frac{504}{12} \text{or} a = -2.250.03387 \times 42 \qquad , a = \text{awrt} -0.827$	M1 ,A1
	y = -0.827 - 0.0339x	A1(dep on M2) (4)
(d)	$[y = -0.827 - 0.0339(32) =]-1.9^{\circ}C$ <u>awrt -1.9</u> (no fractions)	B1 (1)
(e)	$\frac{(w-32)}{1.8} = -0.827 - 0.0339x (\text{o.e.})$	M1
	w = 30.5 - 0.061x	A1 (2)
(f)(i) (ii)	$Var(W) = 1.8^2 Var(Y), = 0.602$ $r_{yx} = r_{yy} = -0.928$ <u>awrt 0.60</u>	M1, A1 B1ft
		(3) [17 marks]
	Notes	
(a)	B1 either fraction or exact decimal equivalent [must see mean separately to e	earn this mark]
	M1 for expr' for variance $\frac{62.98}{12} - \overline{y}^2$ [ft \overline{y}] or $\frac{S_{yy}}{12}$, (allow s^2 i.e. $\frac{S_{yy}}{11}$ = awrt 0.203) [No \sqrt{z}]	
	For M1 in (b)(i) and 1^{st} M1 in (c) do not allow ft for $S_{xy} = -119$	0.7
(b)(1)	B1 Correct expression for S_{xy} or -56.7 (May be implied by a correct value	for <i>r</i>)
	M1 for correct express' for r with 1674, 2.23 and their S_{xy} [Correct ans. only 3/3, r =	= - 0.93 is 2/3]
(ii)	B1 for Priya's belief not supported <u>and</u> reason e.g. negative correlation <u>or</u> r is negative <u>or</u> r is close to -1 <u>or</u> as salinity (or x) increases, temperature (or y) decreases	
(c)	1^{st} M1 for correct expression for b ft their S (May be implied by correct answer)	
(0)	1 W1 for correct use of $a = \overline{u}$, $b\overline{u}$ to find a (ft their value of b) (Implied by 0.827)	
	1 st A1 for a = awrt -0.827 (no fraction) 2 nd A1 for an equ'n in the form $y = a + bx$ with their a and $b = awrt -0.0339$ (no fraction)	
(e)	M1 for substituting $\frac{(w-32)}{1.8}$ for y (o.e.) in their regression equation	
	A1 for a correct equation for w in terms of x with $c = awrt 31$ and $d = awrt - 0.061$	
(f)(i) (ii)	M1 for $1.8^2 \times Var(Y)$ f.t. their "(a)" (if > 0)][Allow use of $s^2 = awrt 0.66$ to score M1A1] B1ft their answer to (b)(i) to at least 2sf (Must see a value written down here)	

Question Number	Scheme	Marks
4. (a)	$[E(X) =]5 \times 0.13 + 6 \times 0.21 + 7 \times 0.29 + 8 \times 0.37, = \underline{6.9}$	M1, A1
(b)	$[E(X^{2}) =]5^{2} \times 0.13 + 6^{2} \times 0.21 + 7^{2} \times 0.29 + 8^{2} \times 0.37 [= 48.7]$ Var(X) = 48.7 - '6.9' ² , = <u>1.09</u>	(2) M1 M1, A1 (3)
(c)	$Var(3-2X) = (-2)^2 Var(X), = 4.36$	M1, A1
(d)	$[E(Y)] = 6.5 \text{ or } \frac{13}{2} \text{ (o.e.)}$	$B1 \qquad (1)$
(e)	P(X = Y) = $\frac{1}{4} \times 0.13 + \frac{1}{4} \times 0.21 + \frac{1}{4} \times 0.29 + \frac{1}{4} \times 0.37$, = $\frac{1}{4}$ (oe)	M1, A1 (2)
(f)	$P(X > Y) = P(X = 6 \cap Y < 6) + P(X = 7 \cap Y < 7) + P(X = 8 \cap Y < 8)$ = 0.21×0.25+0.29×0.50+0.37×0.75	M1 M1
	= <u>0.475</u>	A1 (3)
		[13 marks]
	Notes	
(a)	M1 for a correct expression for $E(X)$ (Correct answer only is M1A1)	
(b)	1 st M1 for attempting a correct expression for $E(X^2)$, sum of at least 3 correct products seen The first M1 can be implied by 48.7 Stating $Var(X) =$ the expression for $E(X^2)$ can score M1M0A0 and may get M1 in (c) 2 nd M1 for correct use of Var $(X) = E(X^2) - [E(X)]^2$ f.t. their $E(X)$ A1 for 1.09 (Correct answer only is M1M1A1)	
(c)	M1 for $(-2)^2 \operatorname{Var}(X)$ or $(-2)^2 \times '(b)'[\text{if '}(b)' > 0]$ (condone no brackets if final <u>or</u> a fully correct expr' for $\operatorname{Var}(3 - 2X)$ based on $\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$	answer is > 0) -11 -13 0.29 0.37
(e)	M1 for an expression for $P(X = Y)$ (at least 3 of the 4 products correct). May be implied by a correct answer.	
(f)	1 st M1 for a correct probability formula (as in scheme) <u>or</u> complete list of $X >$ and $Y=5$; $X=7$ and $Y=6$; $X=7$ and $Y=5$; $X=8$ and $Y=5$; $X=8$ and $Y=6$; Z^{nd} M1 for a correct probability expression(i.e. correct values in formula) NB alternative expressions e.g. $\frac{1}{4}(0.37+0.66+0.87)$ from listing $Y < X$ rates. The 1 st M1 may be implied by scoring the 2 nd M1 A1 for 0.475 or $\frac{19}{40}$	Y [e.g. X = 6 X = 8 and Y = 7] ther than X > Y
SC/ (Y>X)	Only apply if they reach $[P(Y > X) = 0.13 \times \frac{3}{4} + 0.21 \times \frac{2}{4} + 0.29 \times \frac{1}{4} =$	0.27 <u>5</u>

Question Number	Scheme	Marks
5. (a)	Age Computer use	
0. (u)	0.80 Use computer every day	D1
	<i>p</i> (0.20) Does not use computer every day	BI
	$(1-p)$ 0.55 Use computer every day ≥ 50	B1
	(0.45) Does not use computer every day	(2)
(b)	$p \times 0.80 + (1 - p) \times 0.55 = 0.70$ p = 0.6	M1 A1 (2)
(c)	$\left[P(<50 \text{ use computer daily})\right] = \frac{P(<50 \cap \text{ use computer daily})}{P(\text{ use computer daily})} = \frac{'0.6' \times 0.80}{0.70}$	M1
	$=\frac{48}{70}$	A10e
		(2) [6 marks]
	Notes	
(a)	Allow undefined letters for labels e.g. $U(use)$ and U' or N and NE Allow labels on branches and probabilities at the endsCondone 80% and 55% etc on tree diagram and in (b)1st B1 for correct shape (2 branches then 4 branches) and correct labels on first set of branches (p , < 50 and \geq 50 but condone > 50)2nd B1 for correct labels on second set of branches (0.80, 0.55, daily and not daily) Allow 0.8 p and 0.55(1 - p) on or at the end of the appropriate branches. NB they do not require the probabilities in brackets for either of these two marks.	
(b)	 M1 for a correct equation to find p using their tree diagram. A1 for 0.6 [condone 60%] (Correct answer only will score M1A1) 	
(c)	M1 for a correct expression with 0.70 substituted correctly and numerator < de <u>or</u> correct ratio of probabilities f.t. their <i>p</i> provided $048 24$	nominator
	A1 for $\frac{40}{70}$ or an exact equivalent e.g. $\frac{24}{35}$ (Correct answer only is M1A1) Allow awrt 0.686 following a correct expression. [68.6% is A0]	

Question Number	Scheme	Marks
6. (a)	98% (Condone 0.98)	B1
		(1)
(b)	$z = \pm 2.3263$ (or better: calculator gives 2.326347877)	B1
	256 - 250 - 2.3263	M1
	σ -2.5205	
	$\sigma = 2.579$ <u>awrt 2.58</u>	A1
		(3)
(c)	$[P(X < 246 \cup X > 254) =]$	
	$2 \times P\left(Z > \frac{254 - 250}{"2.579"}\right) \underline{\text{or}} 1 - P\left(\frac{246 - 250}{"2.579"} < Z < \frac{254 - 250}{"2.579"}\right)$	M1
	$= 2 \times P(Z > 1.55)$ or $1 - P(-1.55 < Z < 1.55) = 0.12(12)$	A1
	P(both bags outside range) = $(0.1212)^2$ =, 0.01468 awrt 0.0146/7	dM1, A1
		(4)
		[8 marks]
	Notes	
(b)	B1 for \pm 2.3263 or better seen and used, can be with σ^2 (may be implied by σ	= awrt 2.579)
	M1 for standardising with 256 or 244, 250 and σ and equating to a z-value $ z > 1$	2
	A1 for awrt 2.58 from correct working.	
<i>z</i> = 2.33	Use of $z = 2.33$ leads to $\sigma = 2.575$ can score B0M1A1	
<i>z</i> = 2.32	Special case: use of $z = 2.32$ from tables gives 2.586 $\sigma = $ awrt 2.59 can score	B0M1A1
Ans only	B1M1A1 can be awarded for sight of at least σ = awrt 2.5791 or awrt 2.5792	
(c)	1^{st} M1 for attempt to find sum of the area above 254 and below 246 or 2 × area	above 254
	or 2 × area below 246 (2 × needed) Allow ft of their σ (provided $\sigma > 0$)
	1^{st} A1 for awrt 0.12 (NB 1 – 0.1212 = 0.8788 is A0 here and 1^{st} M0 too)	
	2^{nd} dM1 for p^2 dependent on previous M1	
	2 nd A1 for awrt 0.0146 (use of calculator value) or 0.0147	
SC	'B1' for those who use 1 tail only and get 0.06 but then do $(0.06)^2$ Score as Do not award for $2 \times (0.06)^2$ or $3 \times (0.06)^2$	M0A0M1A0

Question Number	Scheme	Marks	
7. (a)	Sum of probabilities = 1 gives $\frac{a+b}{60} + \frac{2a+b}{60} + \frac{3a+b}{60} + \frac{4a+b}{60} = 1$	M1	
	e.g. $\frac{10a+4b}{60} = 1$ leading to $5a+2b = 30*$	A1cso (2)	
(b)	$P(X = 1) + P(X = 2) + P(X = 3) = \frac{13}{20}$ or $P(X = 4) = \frac{7}{20}$ (o.e.)	M1 A1	
	$\frac{6a+3b}{60} = \frac{13}{20} \qquad \qquad \underline{\text{or}} \frac{4a+b}{60} = \frac{7}{20}$		
	e.g. $(6a+3b=39)\times 2 (5a+2b=30)\times 3$ leading to $3a=12$ $(4a+b=21)\times 2 (5a+2b=30)$ leading to $3a=12$ $(5a+2b=30)$	dM1	
	$\underline{a} = \underline{4}$ and $\underline{b} = \underline{5}$	A1	
(c)	$\begin{bmatrix} y \end{bmatrix} \begin{bmatrix} z \\ z \end{bmatrix} \begin{bmatrix} 1 \\ z \\ z \end{bmatrix} \begin{bmatrix} y \\ z \end{bmatrix} \begin{bmatrix} 4 \\ z \\ z \end{bmatrix} \begin{bmatrix} y \\ z \end{bmatrix} \begin{bmatrix} 0 \\ z \\ z \end{bmatrix} \begin{bmatrix} z \\ z \end{bmatrix} \begin{bmatrix} 1 \\ $	(4) R1	
	$\begin{bmatrix} y \\ y \end{bmatrix} \begin{bmatrix} -1 \\ 1 \end{bmatrix} = \begin{bmatrix} 1 \\ 1 \end{bmatrix} \begin{bmatrix} y \\ 4 \end{bmatrix} \begin{bmatrix} y \\ 4 \end{bmatrix} \begin{bmatrix} y \\ 9 \end{bmatrix} = \begin{bmatrix} 1 \\ 30 \end{bmatrix} = \begin{bmatrix} 1 \\ 20 \end{bmatrix} = \begin{bmatrix} 1 \\ 30 \end{bmatrix} = \begin{bmatrix} 1 \\ 20 \end{bmatrix} = \begin{bmatrix} 1 \\ 30 \end{bmatrix} = \begin{bmatrix} 1 \\ 20 \end{bmatrix} = \begin{bmatrix} 1 \\ 30 \end{bmatrix} = \begin{bmatrix} 1 \\ 20 \end{bmatrix} = \begin{bmatrix} 1 \\ 30 \end{bmatrix} = \begin{bmatrix} 1 \\ 20 \end{bmatrix} = \begin{bmatrix} 1 \\ 30 \end{bmatrix} = \begin{bmatrix} 1 \\ 20 \end{bmatrix} = \begin{bmatrix} 1 \\ 30 \end{bmatrix} = \begin{bmatrix} 1 \\ 20 \end{bmatrix} = \begin{bmatrix} 1 \\ 30 \end{bmatrix} = \begin{bmatrix} 1 \\ 20 \end{bmatrix} = \begin{bmatrix} 1 \\ 30 \end{bmatrix} = \begin{bmatrix} 1 \\ 20 \end{bmatrix} = \begin{bmatrix} 1 \\ 30 \end{bmatrix} = \begin{bmatrix} 1 \\ 20 \end{bmatrix} = \begin{bmatrix} 1 \\ 30 \end{bmatrix} = \begin{bmatrix} 1 \\ 20 \end{bmatrix} = \begin{bmatrix} 1 \\ 30 \end{bmatrix} = \begin{bmatrix} 1$	B1 B1cao M1 A1 (4)	
	Notes	[10 marks]	
(a)	1^{st} M1 for use of sum of probabilities = 1 to form a linear equation in <i>a</i> and <i>b</i> (4)	terms seen)	
()	A1 cso for fully correct solution with no errors or omissions seen and at least on	e	
	intermediate line of working seen		
(b)	1 st M1 for use of $\sum_{i=1}^{3} P(X=i) = \frac{13}{20}$ or $P(X=4) = \frac{7}{20}$ to form a 2 nd equation in	a and <i>b</i>	
	1 st A1 for a correct 3 term 2^{nd} equation in <i>a</i> and <i>b</i> with <i>a</i> and <i>b</i> terms collected.		
	2^{nd} dM1 dependent on 1^{st} M1 for solving 2 relevant linear equations i.e. eliminating <i>a</i> or <i>b</i>		
	leading to a linear equation in 1 variable. Allow 1 numerical or sign sl	lip.	
	2^{nd} A1 for both $a = 4$ and $b = 5$ (Correct answer only can score all 4 marks)	2 2	
(c)	1 st B1 for all y-values, can allow label of x^2 (accept 1, 4, 9 and 16 or 1, 2 ² ,	3 ² , 4 ²)	
	2^{nd} B1cao for Fr(1) = $\frac{9}{60}$ or but must be clearly labelled as cdf linked to Y = 1	but not for	
	P(Y = y) or P(Y = 1) M1 for a correct method to find Fr(4) or Fr(9) ft their <i>a</i> and <i>b</i> [dep' on correct y-values seen] A1 for fully correct cumulative distribution function allow F(1) = $\frac{9}{60}$, F(4) = $\frac{22}{60}$, F(9) = $\frac{39}{60}$, F(16)=1		
	NB $F(y) = \frac{2y + 7\sqrt{y}}{10}$ for y = 1.4.9.16 (o.e.) NB: Probability distribution of y	X	
	$\begin{array}{c c} 60 \\ \hline x \\ \hline x \\ \hline y \\ y \hline y \\ y \\$	3 4 7 21	
	$J \qquad J \qquad$	50 60	

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