Question	Scheme	Marks
3 (a)	$\frac{86\times300}{1200}$ or $\frac{1114\times300}{1200}$	M1
	21.5 and 278.5	A1
		(2)
(b)	H_0: Making a claim and age are independent (not associated) H_1: Making a claim and age are not independent (associated)	B1
	Observed / Expected / $\frac{(O-E)^2}{E}$ 14 / "21.5" / $\frac{(14-"21.5")^2}{"21.5"} = 2.6162\ldots$ 286 / "278.5" / $\frac{(286-"278.5")^2}{"278.5"} = 0.20197\ldots$	M1
	$\sum\frac{(O-E)^2}{E} = 7.123+"2.616..."+"0.2019..."$	M1
	$= 9.941\ldots$ awrt 9.94	A1
	$\nu = (2-1)(3-1) = 2$	B1
	$\chi^2_2(0.01) = 9.210 \Rightarrow$ CR: $X^2 \geqslant 9.21[0]$	B1ft
	[in the CR/significant/Reject H_0] There is sufficient evidence to suggest that making a **claim** is not independent of **age**.	dA1ft
		(7)

	Notes	**Total 9**
(a)	**M1**	A correct method for finding one expected value. Implied by one correct value.
	A1	Correct answer for both 21.5 and 278.5
(b)	**B1**	For both hypotheses correct. Must mention claim and age at least once. Use of "relationship" or "correlation" or "connection" is B0
	M1	A correct method for finding both contributions to the χ^2 value or awrt 2.62 or awrt 0.202 Allow truncated answers of 2.61 and 0.201 May be implied by awrt 9.94
	M1	Adding their two values to 7.123 (may be implied by a full χ^2 calculation, with at least 3 correct expressions or values. Do not ISW)
	A1	awrt 9.94
	B1	$\nu = 2$ This mark can be implied by a correct critical value of 9.21 or better
	B1ft	9.21[0] or better ft their Degrees of freedom common ones $\nu = 3$ is 11.345
	dA1ft	Independent of hypotheses but dependent on both M marks being awarded. We will ft their test statistic and CV only. A correct contextual conclusion compatible with their values, which has the words claim and age. eg if they have 11.345 and 9.94 they should say it is independent/ not associated. Do not allow contradicting statements.

Full calculations for(b)

eg $\frac{(24-14.33)^2}{14.33}+\frac{(176-185.67)^2}{185.67}+\frac{(48-50.17)^2}{50.17}+\frac{(652-649.83)^2}{649.83}+\frac{(14-"21.5")^2}{21.5}+\frac{(286-"278.5")^2}{278.5}$

or awrt $6.52+$ awrt $0.5+$ awrt $0.09+$ awrt $0.01+$ awrt $2.62+0.20$

or $\frac{24^2}{14.33}+\frac{176^2}{185.67}+\frac{48^2}{50.17}+\frac{652^2}{649.83}+\frac{14^2}{"21.50"}+\frac{286^2}{"278.5"}-1200$

or awrt 40.19 + awrt 166.83 + awrt 45.92 + awrt 654.17 + awrt 9.116 + awrt 293.702 – 1200