Question Number	Scheme	Marks
1 (a)	Po(isson) with $(\lambda =)4$	B1
		(1)
(b)	Pairs of **shoes** (are **sold**) singly/randomly/independently/at a **constant** (average) **rate**	B1
		(1)
(c) (i)	X = number of sales per hour $\Rightarrow X \sim$ Po(4)	
	$P(X > 4) = 1 - P(X \leqslant 4)$	M1
	= 0.3712 awrt 0.371	A1
(ii)	$('0.371...')^3$	M1
	= 0.051147… 0.05115 or awrt 0.0511	A1
		(4)
(d)	$H_0 : \lambda = '4'$ $H_1 : \lambda > '4'$	B1ft
	$P(X \geqslant 7) = 1 - P(X \leqslant 6)$ or $P(X \geqslant 9) = 1 - P(X \leqslant 8) = 0.0214$	M1
	= 0.1107 or CR $X \geqslant 9$ awrt 0.111	A1
	Not significant/Do not reject H_0 /Not in the critical region	M1
	There is insufficient evidence of an <u>increase</u> in <u>sales</u> following the appearance of the advert/<u>manager's</u> <u>belief</u> is not supported.	dA1
		(5)
	Notes	**Total 11**

(a)	**B1**	For Po or Poisson and 4 must be seen in part (a). Do not allow P(4)
(b)	**B1**	For one of the given assumptions in context (must have context of **shoes** or **sales**). Ignore extraneous non-contradictory comments.
(c) (i)	**M1**	For writing or using $P(X > 4) = 1 - P(X \leqslant 4)$
	A1	awrt 0.371
(ii)	**M1**	'part (i)'^{3}
	A1	0.05115 or awrt 0.0511 (Calculator gives 0.051132…)
(d)	**B1ft**	Both hypotheses correct. Must be in terms of λ or μ ft their λ from part (a) Must be attached to H_0 and H_1
	M1	For writing or using $P(X \geqslant 7) = 1 - P(X \leqslant 6)$ If a CR approach is taken then award M1 for $P(X \geqslant 9) = 1 - P(X \leqslant 8)$ written or used This mark may be implied by a correct *p*-value or CR
	A1	awrt 0.111 or CR $X \geqslant 9$
	M1	Any correct ft statement consistent with their *p*-value and 0.05 **or** their CR and 7 – no context needed but do not allow contradicting non contextual comments. The comparison of their *p*-value and the significance level is not counted as a non contextual statement. May be implied by a correct ft conclusion in context.
	dA1	Dependent on 1st M1 - Correct conclusion in context which must be **not rejecting** H_0. Must include the underlined words (oe).