JAN 201	2								•				JUNE 2013	2				(d			~						
JAN 201	्र इ	(III)	3	3			(b)	3	(a) (i)				30NL 2013	6	3	3		9	1	3	(a) (i)						
	Give to thr	Give three	Calc: each	State			The three custo Y, so	Use	Show	-		make of £1 show distri	expl	A small do not v explain	the s	the n	withdraw State whe	The bank	Find the withdraw	Show	Find the						A ba with the a
	one c	one eacl	ılate t day.	the	7		The manager conthree. Assuming customers stays: Y, sold daily und	this m	v that the	P (X =	×	makes a prof of £16. At p shown that th distribution s		small number not withdraw plain why thi	andar	mean of	ted the		the pr	Show that the	_						A bank has a withdraw cathe amounts
	ve one disadvantage three each day.	advantage 1 day.	he me	value o	P(Y=y)	:	ger con uming stays i	Use this mean value of X show that the restaurant's	the m	<i>x</i>)	\dashv	makes a profit of £24. On of £16. At present, the mar shown that the number of lodistribution shown in Table		mber of draw this	standard deviation of X	fX;	red that som raw £300. whether this	is cons	probability that a ws more than the	the sta	alue of						ash. \s avai
	anta ge	age of	an da	of k.		-	considers ing that i ys the sa- under thi	alue o staurai	mean va	0.1	0	f £24. (ent, the umber con in Ta		of cus any c woul	ation		ne of the	iderin	lity th than t	ındard	of E(X)						TM (Withd lable
	of the	the n	ily pro		0.1	>	lers redu at the dia same, T this new		value of		\dashv	On each le manager of lobsters		customer y cash. I ould decr	of X.		the cu	considering making	at at leas he mean	devia	·			Т			Auton rawals and th
	ma	1ana gei	ofit fix			-	The manager considers reducing the number three. Assuming that the distribution of the customers stays the same, Table 2 shows the Y, sold daily under this new arrangement.	nd the ean d	f X is	0.15	_	each lol lager bu bsters, 1.		r of customers use to any cash. If the test would decrease to			would inc	ing an	least o ean am	tion o		200	100	20	10	×	tated can le prol
	nager r	er redu	om the		0.15	Table	he numbion of the shows	corre	2.3 , ;		\dashv	lobster buys for s, X, re		he abl			ners who		t one out o amount of	y X		\mathbf{H}		+	H	-	Teller se ma sabilit
	educing	icing	Calculate the mean daily profit from the lobsters each day.			2	W 5 _	ofit o	and ca	0.25	2	er unsol four lo request		ATM to e were ch mean of				additional	of a	68.0		0.17	0.08	0.44	0.18	P(X=x)	Mach de in : y distr
	ng the	the nu			0.25	s	of lobsters the number of log distribution	and the corresponding mean mean daily profit on lobsters	and calculate		_	lobster unsold at the ϵ buys four lobsters ears, X , requested daily label 1		ang X.			ase	amount	a random	, corre						<u> </u>	ine) w fixed a ributio
	numb	number	when the				표 0 년	ean va	the	0.35	s	ne end each ily by		ಕೆ ಕ್ಷ			withd or lea	int of £300	n sample	xt to 1							hich of amour
	er of	of lot			> 0	a l	rs that she buys each f lobsters requested of ion of the number of	llue of £28.	standard		4	of the day.		ilance i include			draw £	£300 a	ple of	standard deviation of X is 68.0, correct to three significant figures (3 m							custon its, £) X.
	lobsters	lobsters	ager l				e buys ea requeste number	lobst		0.15	4	ers de		n their these			£200 wou unchanged	0 available.	of three	ignifi							ners c
	tha	that sh	o suus				each sted da ber of	ers un	deviation			y, it mak experien follows		cus			5		custo	cant fi							an use e tabk
	she a	ne buys	manager buys only three (3 marks	(1 n			th day to daily by of lobsters.	value of lobsters unsold to is £28. (2 mar	_			es a ce h the		count and tomers, (2 mar	(2 m		hen	It is	mers 3 m	igures.	(2 marks)						A bank has an ATM (Automated Teller Machine) which customers can use to withdraw cash. Withdrawals can be made in fixed amounts, $\pounds X$. The table shows the amounts available and the probability distribution for X .
	nark)	lys to mark)	ree arks)	(1 mark)			ers,	o arks)	of X. (4 marks)			loss		nd arks)	marks)				arks)	es. marks)	arks)						ò
JUNE 20		vonin	α Λr	20110	rupo	o dio	oo at the w	illogo	hall T	The I	ا المد	must be	JUNE 2011				(c)		(b)	(11)	(a) (i)						
	Every Saturday e tidied and cleaned	d on	ig, Ai the m	igus iornir	runs ng of	the fo	ollowing da	ıllage ıy, Sul	nday.	This	is d	one by			stand	State,	In fact is used which in the	dev	A sm opera emple) Find	Show						In a lengt distri
	Angus and a varia														s which	te, giv	C	deviation	small erates ploye	the	ow that						a pay- gths o tributi
	Angus keeps a record of the number of volunteers, X , and the probability distribution									ation would atton would ct, there is sed by a lar; have been a car park at giving a which are dard deviation.					propo the ca	stand	at the						and-d of time on of				
	for X is given in t	the ta	ble.												in the	reaso	s no c rge nu en pai	d inci	rtion or ur parl re incl	standard deviation of X	mean						pay-and-display car park, hs of time they wish to p bution of the amounts, X
	x	0	1	П	2	3	4	5 6	or mo	ore					e car j f X.	n, wh	charge for number of nrked befo e parked w	ease, stay	of the k, who huded a	viatio	of X						car p wish nount
	P(X=x)	p	0.1	15 0	-	0.21			0						bark a	ether	e for ca er of pe before ced with	stay t	cars are	n of λ	is 279	600	400	200	100	×	ark, u to par s, X p
	<u> </u>						'								t 9 pn	the sta	ople g 6 pm 1 no c	the san	in the car allowed to ers, state,								users a ark thei pence,
(a) (i)	Find the value of	<i>p</i> .													ı ıs gr	ındard	entering the going to m remain charge.	20	car pa d to p te, giv			0			0	P(X	re charg ir cars. I paid by
(ii)	Interpret the impli	icatio	n for	Angu	s of t	his v	alue of p .								eater	devia	in a	ecn	原茶片			0.14	0.21	0.31	0.22	(x = x)	rged of The by use
												[2 marks			than, t	ation o	car park nearby of the car	se.	belong to their cars a reason								liffere follov rs.
(b)	Find the mean value of <i>X</i> and show that, correct to three significant figures, the standard deviation of <i>X</i> is 1.57.										the sai	of the	c after cinem park,		o emplors with n, when								nt am ving t				
	standard deviation	n or 2	I IS I	1.5/.								[5 marks			ne as	amou	6 pm a. At but n		no the								ounts able s
												-			or les	nts paid	l. In the 9 pm, a early all		es of the charge.								accor
																	- LD		_								— —
															s than	d to p		(2		4							ing the
															s than the (2 marks)	d to park the	a few cars	(2 mar	fi If	(4 mark							k, users are charged different amounts according to the park their cars. The following table shows the X pence, paid by users.

The Discrete Uniform Distribution	Definition	Notation
The discrete uniform distribution, when drawn out looks like this:	A discrete random variable is defined as any event subject	P(X = x) means the probability that the random variable 'X' takes the value 'x'
	to when a list can be made of the possible outcomes	$P(X \neq x)$ means the probability that the random variable 'X' does not take the value 'x'
	When a list can be made of the possible dateomes	P(X < x) means the probability that the random variable 'X' is less than the value 'x'
		P(X > x) means the probability that the random variable 'X' is greater than the value 'x'
	The Continuous Uniform Distribution	$P(X \le x)$ means the probability that the random variable 'X' is less than or equal to the value 'x'
	NOTE THAT	$P(X \ge x)$ means the probability that the random variable 'X' is more than or equal to the value 'x'
The Discrete Uniform Distribution occurs when the probability of each outcome is	The Uniform Distribution can be used	
	for both discrete and continuous data. These characteristics of the discrete	
If a Discrete Uniform Distribution has $m{n}$ outcomes the probability of each outcome is	uniform distribution DO NOT always	
	apply for the continuous uniform	Activity
The Uniform Distribution is sometimes known as the rectangular distribution because	distribution as well	P(X = x) = 0.32 means
		P(X ≠ x) = 0.06 means
		P(X < x) = 0.87 means
When the values are evenly spaced, you can find the mean and median by:	DISCRETE RANDOM	$P(X > x) = 0.54 \text{ means}$ $P(X \le x) = 0.19 \text{ means}$
•	VARIABLES	$P(X \ge x) = 0.73 \text{ means}$
•	Revision Mat	
		$P(X = x) = \begin{cases} 1/3 & x = 1,2,3 \\ 0 & otherwise \end{cases}$ means
	Expectation and Variance	
A random variable is a variable whose value is (within limits) determined by	·	
The mean of a discrete random variable X is also known as the		is denoted as:
This can be 'shown' by multiplying each x value by its	and adding up the results or simply using the ca	alculator for mean where the frequency is the
The variance of a discrete random variable V is denoted by:		
The variance of a discrete random variable X is denoted by:		
Where E(X ²) is calculated by multiplying each x value by	and then it's	REMEMBER:
The mode of a discrete random variable is the observation with the	probability	

The median of a discrete random variable is where the probability of ______ would lie if we calculated P(X < x)