



# **Level 2 Mathematics and Statistics, 2019**

9.30 a.m. Thursday 21 November 2019

FORMULAE SHEET for 91261, 91262, 91267

Refer to this sheet to answer the questions in your Question and Answer Booklets.

Check that this sheet is printed on the back.

YOU MAY KEEP THIS SHEET AT THE END OF THE EXAMINATION.

## **Quadratic Equations**

If 
$$ax^2 + bx + c = 0$$
  
then  $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$   
and  $\Delta = b^2 - 4ac$ 

### Logarithms

If 
$$y = b^x$$
 then  $x = \log_b y$   

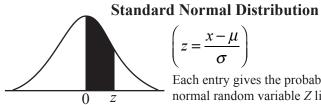
$$\log_b (x^n) = n \log_b x$$
If  $y = e^x$  then  $x = \log_e y$  (= ln y)

### **Calculus**

$$\frac{\mathrm{d}}{\mathrm{d}x}\left(x^n\right) = nx^{n-1}$$

If 
$$f'(x) = x^n$$
, then  $f(x) = \frac{x^{n+1}}{n+1} + c$ 

## L2-MATHF



$$\int z = \frac{x - \mu}{\sigma}$$

Each entry gives the probability that the standardised normal random variable Z lies between 0 and z.

#### Differences

_											Differences								
Z	0	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9
0.0	.0000	.0040	.0080	.0120	.0160	.0199	.0239	.0279	.0319	.0359	4	8	12	16	20	24	28	32	36
0.1	.0398	.0438	.0478	.0517	.0557	.0596	.0636	.0675	.0714	.0754	4	8	12	16	20	24	28	32	36
0.2	.0793	.0832	.0871	.0910	.0948	.0987	.1026	.1064	.1103	.1141	4	8	12	15	19	22	27	31	35
0.3		.1217									4	8	11	15	19	22	26	30	34
		.1591									4	-	11		18			29	-
0.4	.1334	.1371	.1020	.1004	.1700	.1750	.1//2	.1000	.10-1-1	.10//	'	,	11	17	10		23		32
0.5	.1915	.1950	.1985	.2019	.2054	.2088	.2123	.2157	.2190	.2224	3	7	10	14	17	21	24	27	31
0.6	.2258	.2291	.2324	.2357	.2389	.2422	.2454	.2486	.2518	.2549	3	6	10	13	16	19	23	26	29
0.7	.2580	.2612	.2642	.2673	.2704	.2734	.2764	.2794	.2823	.2852	3	6	9	12	15	18	21	24	27
0.8		.2910									3	6	8		14		19	22	25
0.9		.3186									3	5	8		13			20	
0.5	.5157	.5100	.5212	.5250	.5201	.5207	.5515	.55 10	.5505	.550)		0		10	13	10	10	-0	
1.0	.3413	.3438	.3461	.3485	.3508	.3531	.3554	.3577	.3599	.3621	2	5	7	9	12	14	16	18	21
1.1	.3643	.3665	.3686	.3708	.3729	.3749	.3770	.3790	.3810	.3830	2	4	6	8	10	12	14	16	19
1.2	.3849	.3869	.3888	.3907	.3925	.3944	.3962	.3980	.3997	.4015	2	4	5	7	9	11	13	15	16
1.3	.4032	.4049	4066	4082	4099	.4115	.4131	.4147	.4162	.4177	2	3	5	6	8	10	11	13	14
		.4207									1	3	4	6	7	8		11	
											1		•	_					-
1.5	.4332	.4345	.4357	.4370	.4382	.4394	.4406	.4418	.4429	.4441	1	2	4	5	6	7	8	10	11
1.6	.4452	.4463	.4474	.4484	.4495	.4505	.4515	.4525	.4535	.4545	1	2	3	4	5	6	7	8	9
1.7	.4554	.4564	.4573	.4582	.4591	.4599	.4608	.4616	.4625	.4633	1	2	3	3	4	5	6	7	8
1.8	.4641	.4649	.4656	.4664	.4671	.4678	.4686	.4693	.4699	.4706	1	1	2	3	4	4	5	6	6
1.9	.4713	.4719	.4726	.4732	.4738	.4744	.4750	.4756	.4761	.4767	1	1	2	2	3	4	4	5	5
																			į
2.0		.4778									0	1	1	2	2	3	3	4	4
2.1	.4821	.4826	.4830	.4834	.4838	.4842	.4846	.4850	.4854	.4857	0	1	1	2	2	2	3	3	4
2.2	.4861	.4864	.4868	.4871	.4875	.4878	.4881	.4884	.4887	.4890	0	1	1	1	2	2	2	3	3
2.3	.4893	.4896	.4898	.4901	.4904	.4906	.4909	.4911	.4913	.4916	0	0	1	1	1	2	2	2	2
2.4	.4918	.4920	.4922	.4925	.4927	.4929	.4931	.4932	.4934	.4936	0	0	1	1	1	1	1	2	2
2.5	4020	10.10	40.41	10.12	10.15	10.16	40.40	10.10	4051	1052	_	0		1	1	1	1	1	
2.5		.4940									0	0	0	1	1	1	1	1	1
2.6		.4955									0	0	0	0	1	1	1	1	1
2.7		.4966									0	0	0	0	0	1	1	1	1
2.8		.4975									0	0	0	0	0	0	0	0	1
2.9	.4981	.4982	.4982	.4983	.4984	.4984	.4985	.4985	.4986	.4986	0	0	0	0	0	0	0	0	1
3.0	1087	.4987	1097	1080	1080	1080	1080	1080	4000	4000	0	0	0	0	0	0	0	0	0
		.4987											-			-	-		
3.1											0	0	0	0	0	0	0	0	0
3.2		.4993									0	0	0	0	0	0	0	0	0
3.3		.4995									0	0	0	0	0	0	0	0	0
3.4	.4997	.4997	.4997	.4997	.4997	.4997	.4997	.4997	.4998	.4998	0	0	0	0	0	0	0	0	0
3.5	4998	.4998	4998	4998	4998	4998	4998	4998	4998	4998	0	0	0	0	0	0	0	0	0
3.6		4998									0	0	0	0	0	0	0	0	0
3.7		.4998										0	0	0	0	0	0	0	0
													-			-			
3.8		.4999									0	0	0	0	0	0	0	0	0
3.9	.5000	.5000	.5000	.5000	.5000	.5000	.5000	.5000	.5000	.5000	0	0	0	0	0	0	0	0	0