





# **Level 2 Mathematics and Statistics, 2012**

2.00 pm Monday 19 November 2012

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.

### **Quadratics**

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**

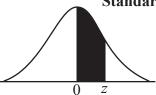
$$\frac{\mathrm{d}}{\mathrm{d}x}\left(x^n\right) = nx^{n-1}$$

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

## **Probability**

$$Z = \frac{X - \mu}{\sigma}$$

\_ Standard Normal Distribution



2

$$\left(Z = \frac{X - \mu}{\sigma}\right)$$

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				.0517							4		12	l	20			32			
0.2				.0910							4		12		19			31			
0.2				.1293							4		11		19			30			
0.3				.1664							4	-	11		18			29	-		
0.4											7	,	11	14	10	22					
0.5				.2019							3		10		17			27			
0.6				.2357							3		10	_	16			26			
0.7				.2673							3	6	9	1	15	- 1		24			
0.8				.2967							3	6	8		14			22			
0.9	.3159	.3186	.3212	.3238	.3264	.3289	.3315	.3340	.3365	.3389	3	5	8	10	13	15	18	20	23		
1.0	.3413	.3438	.3461	.3485	.3508	.3531	.3554	.3577	.3599	.3621	2	5	7	9	12	14	16	18	2		
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		
1.4	.4192	.4207	.4222	.4236	.4251	.4265	.4279	.4292	.4306	.4319	1	3	4	6	7	8	10	11	1.		
1.5	1332	1315	1357	.4370	1382	1301	1106	1/110	1120	4441	1	2	4	5	6	7	8	10	1		
1.6				.4484							1	2	3	4	5	6	7	8	1		
												2	3								
1.7				.4582							1		-	3	4	5	6	7			
1.8				.4664							1	1	2	3	4	4	5	6			
1.9	.4/13	.4/19	.4/26	.4732	.4/38	.4/44	.4/50	.4/56	.4/61	.4/6/	1	1	2	2	3	4	4	5			
2.0	.4772	.4778	.4783	.4788	.4793	.4798	.4803	.4808	.4812	.4817	0	1	1	2	2	3	3	4			
2.1	.4821	.4826	.4830	.4834	.4838	.4842	.4846	.4850	.4854	.4857	0	1	1	2	2	2	3	3			
2.2	.4861	.4864	.4868	.4871	.4875	.4878	.4881	.4884	.4887	.4890	0	1	1	1	2	2	2	3			
2.3	.4893	.4896	.4898	.4901	.4904	.4906	.4909	.4911	.4913	.4916	0	0	1	1	1	2	2	2			
2.4	.4918	.4920	.4922	.4925	.4927	.4929	.4931	.4932	.4934	.4936	0	0	1	1	1	1	1	2			
2.5	.4938	.4940	.4941	.4943	.4945	.4946	.4948	.4949	.4951	.4952	0	0	0	1	1	1	1	1			
2.6	.4953	4955	4956	.4957	4959	4960	4961	4962	.4963	4964	0	0	0	0	1	1	1	1			
2.7				.4968							0	0	0	0	0	1	1	1			
2.8				.4977							0	0	0	0	0	0	0	0			
2.9				.4983							0	0	0	0	0	0	0	0			
2.0	1007	1007	1007	.4988	1000	1000	4000	4000	4000	4000	١	0	0	_	0		0	0			
3.0				.4988							0	0	0	0	0	0	0	0			
											0		-	0			0				
3.2				.4994							0	0	0	0	0	0	0	0			
3.3				.4996							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			
3.5	.4998	.4998	.4998	.4998	.4998	.4998	.4998	.4998	.4998	.4998	0	0	0	0	0	0	0	0			
3.6	.4998	.4998	.4999	.4999	.4999	.4999	.4999	.4999	.4999	.4999	0	0	0	0	0	0	0	0			
3.7	.4999	.4999	.4999	.4999	.4999	.4999	.4999	.4999	.4999	.4999	0	0	0	0	0	0	0	0			
3.8	.4999	.4999	.4999	.4999	.4999	.4999	.4999	.5000	.5000	.5000	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			