Final Exam Formula Sheet 17/18

Chapter 10

$\sin 2\alpha = 2\sin\alpha\cos\alpha,$

$\cos 2\alpha = \cos^2\alpha - \sin^2\alpha = 1 - 2\sin^2\alpha = 2\cos^2\alpha - 1$

$$\tan 2\alpha = \frac{2\tan\alpha}{1-\tan^2\alpha}$$

$$\sin\frac{\alpha}{2} = \pm\sqrt{\frac{1-\cos\alpha}{2}} \qquad \cos\frac{\alpha}{2} = \pm\sqrt{\frac{1+\cos\alpha}{2}}$$

$$\tan\frac{\alpha}{2} = \pm\sqrt{\frac{1-\cos\alpha}{1+\cos\alpha}} = \frac{\sin\alpha}{1+\cos\alpha} = \frac{1-\cos\alpha}{\sin\alpha}$$

Chapter 11

$x = r\cos\theta\,, y = r\sin\theta$

$$r = \pm\sqrt{x^2+y^2}, \qquad \tan\theta = \frac{y}{x}$$

$r cis\theta = r(\cos\theta + i\sin\theta)$

$$\sqrt[n]{z} = z^{\frac{1}{n}} = r^{\frac{1}{n}} cis\left(\frac{\theta}{n} + \frac{k\cdot 360}{n}\right)$$

Chapter 14

$$A^{-1} = \frac{1}{|A|}\begin{bmatrix} d & -b \\ -c & a \end{bmatrix}$$

Chapter 13

$t_n = t_1 + (n-1)d$

$t_n = t_1 r^{n-1}$

$$S_n = \frac{n(t_1+t_n)}{2}$$

$$S_n = \frac{t_1(1-r^n)}{1-r}, r \neq 1$$

If $|r| < 1$, then $\lim_{x\to\infty} r^n = 0$

If $|r| < 1$, then $S_n = \frac{t_1}{1-r}, r \neq 1$

$$\sum_{k=1}^{n} k = \frac{n(n+1)}{2}$$

$$\sum_{k=1}^{n} k^2 = \frac{n(n+1)(2n+1)}{6}$$

$$\sum_{k=1}^{n} k^3 = \left[\frac{n(n+1)}{2}\right]^2$$

Chapter 12

$a^2 = b^2 + c^2 - 2bc\cos A$

$b^2 = a^2 + c^2 - 2ac\cos B$

$c^2 = a^2 + b^2 - 2ab\cos C$

$$\mu = \frac{v}{|v|}$$

$$\cos\theta = \frac{u\cdot v}{|u||v|}, \ \sin\theta = \frac{|u\times v|}{|u||v|}$$

$$\begin{vmatrix} + & - & + \\ - & + & - \\ + & - & + \end{vmatrix}$$

Area of a Parallelogram = $\begin{vmatrix} a_1 & b_1 \\ a_2 & b_2 \end{vmatrix}$

Volume of a Parallelepiped = $\begin{vmatrix} a_1 & b_1 & c_1 \\ a_2 & b_2 & c_2 \\ a_3 & b_3 & c_3 \end{vmatrix}$

Chapter 15

$n(A\cup B) = n(A) + n(B) - n(A\cap B)$

$n(A) = n(U) - n(\bar{A})$

$$_nC_r = \frac{n!}{(n-r)!r!}, \ _nP_r = \frac{n!}{(n-r)!}$$

$$(a+b)^n = {}_nC_0a^nb^0 + {}_nC_1a^{n-1}b^1 + {}_nC_2a^{n-2}b^2 + \cdots + {}_nC_na^0b^n$$

Chapter 16

$$P(B|A) = \frac{P(A\cap B)}{P(A)}$$

$$[p + (1-p)]^n = {}_nC_np^n + \cdots + {}_nC_kp^k(1-p)^{n-k} + \cdots + {}_nC_0(1-p)^n$$

Chapter 19

A function is continuous at $x = c$

If $\lim_{x\to c} f(x) = f(c)$

Chapter 17

$$\sigma = \sqrt{\sigma^2} = \sqrt{\frac{(x_1-\bar{x})^2 + (x_2-\bar{x})^2 + \cdots + (x_n-\bar{x})^2}{n}}$$

$$z = \frac{x-\bar{x}}{\sigma}$$

$$\hat{p} - 2\sqrt{\frac{\hat{p}(1-\hat{p})}{n}} < p < \hat{p} + 2\sqrt{\frac{\hat{p}(1-\hat{p})}{n}}$$

$$\hat{p} - 3\sqrt{\frac{\hat{p}(1-\hat{p})}{n}} < p < \hat{p} + 3\sqrt{\frac{\hat{p}(1-\hat{p})}{n}}$$

z	.0	.1	.2	.3	.4	.5	.6	.7	.8	.9
-3	.0013	.0010	.0007	.0005	.0003	.0002	.0002	.0001	.0001	.0000+
-2	.0228	.0179	.0139	.0107	.0082	.0062	.0047	.0035	.0026	.0019
-1	.1587	.1357	.1151	.0968	.0808	.0668	.0548	.0446	.0359	.0287
-0	.5000	.4602	.4207	.3821	.3446	.3085	.2743	.2420	.2119	.1841
0	.5000	.5398	.5793	.6179	.6554	.6915	.7257	.7580	.7881	.8159
1	.8413	.8643	.8849	.9032	.9192	.9332	.9452	.9554	.9641	.9713
2	.9772	.9821	.9861	.9893	.9918	.9938	.9953	.9965	.9974	.9981
3	.9987	.9990	.9993	.9995	.9997	.9998	.9998	.9999	.9999	1.0000-