Trig

De Moivre's Theorem

$z^n = r^n \text{cis}(n\cdot\theta)$

nth Root of $\mathbb{C}$ Numbers

given $z = r \text{ cis}\theta$

$\sqrt[n]{z}$ = n roots

$w_1 = \sqrt[n]{r} \text{ cis}(\frac{\theta}{n})$

$w_2 = \sqrt[n]{r} \text{ cis}(\frac{\theta + 2\pi}{n})$

Exam 3

8.1 The Law of Sines
8.2 The Law of Cosines
8.5 Trigonometric Form for Complex Numbers
8.6 De Moivre's Theorem and *n*th Roots of Complex Numbers
10.4 Mathematical Induction
11.5 Polar Coordinates

$x = r\cdot\cos\theta$

$y = r\cdot\sin\theta$

$\tan\theta_r = |\frac{y}{x}|$

Law of Sines

$\frac{\sin\alpha}{a} = \frac{\sin\beta}{b} = \frac{\sin\gamma}{c}$

Induction

1. n=1
2. assume n=k
3. n=k+1
4. for all n≥1

deg	rad	sinθ	cosθ	tanθ	cotθ	secθ	cscθ
0°	0	0	1	0	—	1	—
30°	$\pi/6$	$1/2$	$\sqrt{3}/2$	$\sqrt{3}/3$	$\sqrt{3}$	$\frac{2\sqrt{3}}{3}$	2
45°	$\pi/4$	$\frac{\sqrt{2}}{2}$	$\sqrt{2}/2$	1	1	$\sqrt{2}$	$\sqrt{2}$
60°	$\pi/3$	$\sqrt{3}/2$	$1/2$	$\sqrt{3}$	$\sqrt{3}/3$	2	$\frac{2\sqrt{3}}{3}$
90°	$\frac{\pi}{2}$	1	0	—	0	—	1

Law of Cosines

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

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

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