

unit 7 formulas:

demoivre's theorem:

$$[r(\cos \theta + i \sin \theta)]^n = r^n (\cos n\theta + i \sin n\theta)$$

the n^{th} roots of a nonzero complex number, $r(\cos \theta + i \sin \theta)$ are:

$$r^{1/n} \left[\cos \left(\frac{\theta}{n} + k \cdot \frac{2\pi}{n} \right) + i \sin \left(\frac{\theta}{n} + k \cdot \frac{2\pi}{n} \right) \right] \quad k = 0, 1, 2, \dots, n-1$$

unit 8 formulas:

general form of a (vertical) parabola with vertex at the origin and focus $(0, a)$:

$$x^2 = 4ay$$

general form of a (horizontal) ellipse with foci at $(-c, 0)$ and $(c, 0)$ and vertices at $(-a, 0)$ and

$(a, 0)$:

$$\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$$

note: $a^2 = b^2 + c^2$.

general form of a (horizontal) hyperbola with foci at $(-c, 0)$ and $(c, 0)$ and vertices $(-a, 0)$

and $(a, 0)$:

$$\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$$

note: $c^2 = a^2 + b^2$ and asymptotes are given by $y = \pm \frac{b}{a}x$