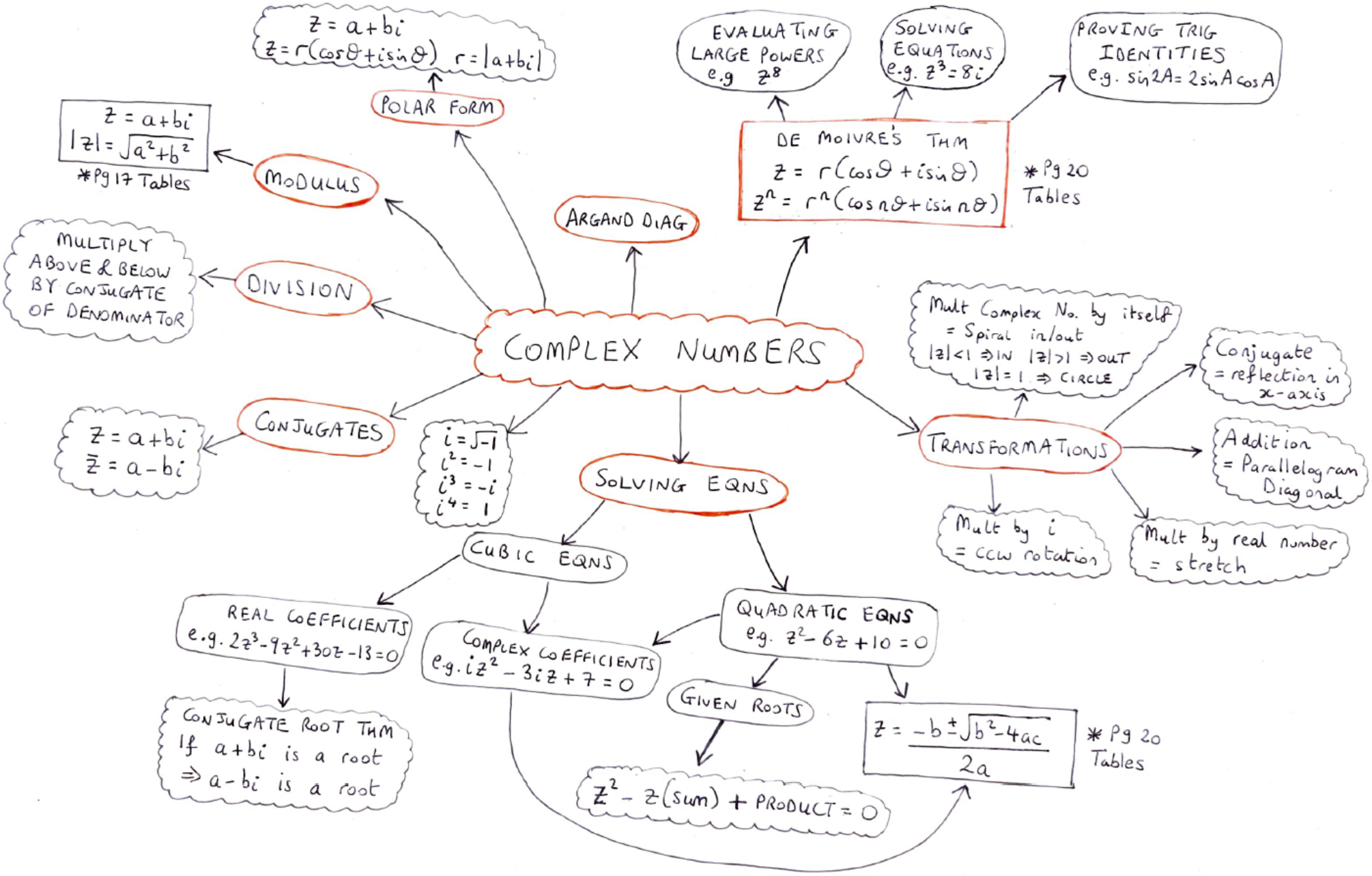

COMPLEX NUMBERS
POLAR FORM
$z = a+bi$
$z = r(\cos\theta + i\sin\theta)$ $r = |a+bi|$
MODULUS
$z = a+bi$
$|z| = \sqrt{a^2+b^2}$
*Pg 17 Tables
ARGAND DIAG
DE MOIVRE'S THM
$z = r(\cos\theta + i\sin\theta)$
$z^n = r^n(\cos n\theta + i\sin n\theta)$
*Pg 20 Tables
EVALUATING LARGE POWERS e.g z^8
SOLVING EQUATIONS e.g. $z^3 = 8i$
PROVING TRIG IDENTITIES e.g. $\sin 2A = 2\sin A\cos A$
DIVISION
MULTIPLY ABOVE & BELOW BY CONJUGATE OF DENOMINATOR
CONJUGATES
$z = a+bi$
$\bar{z} = a-bi$
$i = \sqrt{-1}$
$i^2 = -1$
$i^3 = -i$
$i^4 = 1$
SOLVING EQNS
CUBIC EQNS
REAL COEFFICIENTS
e.g. $2z^3 - 9z^2 + 30z - 13 = 0$
CONJUGATE ROOT THM
If $a+bi$ is a root
$\Rightarrow a-bi$ is a root
COMPLEX COEFFICIENTS
e.g. $iz^2 - 3iz + 7 = 0$
QUADRATIC EQNS
e.g. $z^2 - 6z + 10 = 0$
GIVEN ROOTS
$z^2 - z(\text{sum}) + \text{PRODUCT} = 0$
$z = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$
*Pg 20 Tables
TRANSFORMATIONS
Mult Complex No. by itself = Spiral in/out
$|z|<1 \Rightarrow$ IN $|z|>1 \Rightarrow$ OUT
$|z|=1 \Rightarrow$ CIRCLE
Conjugate = reflection in x-axis
Addition = Parallelogram Diagonal
Mult by i = CCW rotation
Mult by real number = stretch