C3 Condensed Notes

Functions:

Function = one-to-one or many-to-one mapping
Domain = all the possible inputs
Range = all the possible outputs

Inverse of functions: notated $f^{-1}(x)$
Found by rearranging to make "x" the subject, then switching "x" and "y"
A function only has an inverse if it is a one-to-one mapping; if it's many-to-one, restrict it's domain to make it a one-to-one mapping

e.g. for $y = x^2$, restrict domain to $x \geq 0$

Domain and range of a function are switched when you inverse it
Geometrically, $f^{-1}(x)$ is f(x) reflected in y = x, so to find where $f(x) = f^{-1}(x)$, solve f(x) = x or $f^{-1}(x) = x$

Modulus:

|something| = something else

e.g. $|2x - 1| = 6$
find critical value: $|2x - 1|$ so $x = ½$
sub back in and find when mod function multiplies by −1 (in this case, $x < ½$)
if $x > ½$ if $x < ½$
$2x - 1 = 6$ $-2x + 1 = 6$

|something| = |something else|, then square both sides

Modulus inequalities:

- First, solve the inequality: set each side equal
- Find the critical value inequalities (there might be overlap here)
- Set up equations for each critical value inequality
- Check the solution to each equation is valid with the critical value inequality used
- Sub a number less and greater than each solution into the original inequality to find the final solution

C3 Trig. Identites

$$\sin^2\theta + \cos^2\theta = 1$$

$$\tan^2\theta + 1 = \sec^2\theta$$

$$1 + \cot^2\theta = \operatorname{cosec}^2\theta$$