## Section 1: Modulus and argument

### Crucial points

1. **Be very careful when you find the argument of a complex number**
   Always decide first which quadrant the complex number is in, and remember that when you have worked out the value of $\arctan \dfrac{y}{x}$ on your calculator, this will only be correct for complex numbers in the first and fourth quadrant. For the second quadrant, you need to add $\pi$, and for the third quadrant you need to subtract $\pi$. It's a good idea to make a rough sketch of the number on an Argand diagram, so you can 'see' the argument.

   E.g.
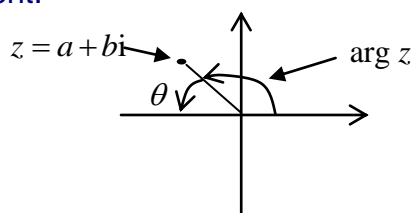
   

   $$\arg z = \pi - \theta,$$
   $$\text{where } \theta = \arctan\left(\dfrac{b}{a}\right)$$

2. **Use the modulus-argument form correctly**
   Remember that the modulus-argument form of a complex number must be of the form $r(\cos\theta + \mathrm{i}\sin\theta)$, with $r$ positive.