Suppose we want to find the *n*th root of a complex number *z*; that is, we

want to find *w* such that



We write *z* and *w* in the form

 

Using DeMoivre’s theorem we have (using the equation )



i) Show that the absolute value of *wn* and *z* are equal. Hence find *R* in terms of *r*.

ii) Equate the arguments of *wn* and *z* to find a general expression for *y* in terms of *x*.

iii) Write down the general formula for the *n*th root of *z*.

iv) Hence find all solutions of the equation 11/4=w.