REVISION SHEET – FP2 (WJEC)

FUNCTIONS AND SETS

The main ideas are:

* Finding the image and inverse image of a set under a real function.

### Before the exam you should know:

* The notation used for intervals, e.g.

, etc.

For example means

* The concept of image of a set A under a function , i.e.
* The concept of image of a set A under the inverse function , i.e. { is defined and }

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| **Example 1**  If is the piecewise function:  What is the image of the set denoted by ?  Solution  Determine whether is continuous at *(also see piecewise function example on Types of Functions revision sheet)*.  As from above, ,  and since 2 is defined for the upper function.  (⇒ discontinuous).  Now work out the upper and lower bounds of the interval passed through the function :    ∴  So, the image of the interval (or set) under are the real numbers between and inclusive and (union) the real numbers between and , but not including 4. | Example 2  In the exam you might be asked to find the inverse image of a set under a function. Knowing the graph of the function is useful . For example,  if find where is the interval [0,10].  This question follows sketching the graph of (*see ‘Graph Sketching’ revision sheet*).    is mapping the interval back from the -axis to the -axis.  We can see that .  ∴ Part of .  But we can see from the graph that the interval [0,10] on the -axis also maps to another interval on the -axis. To do this we work out the values of for which . That is:  Rearranging to obtain a quadratic and factorising gives . Hence the other interval [2,5].  As can be seen, these are the only two intervals because of the asymptotes in between.  ∴ |