

## Definitions for final

Define the following:

1.  $R$  is a relation from  $A$  to  $B$ .
2. The domain of a relation  $R$ .
3. The range of a relation  $R$ .
4. The inverse  $R^{-1}$  of a relation  $R$ .
5. The composition of two relations  $R \circ S$ .
6. The relation  $R$  is reflexive.
7. The relation  $R$  is symmetric.
8. The relation  $R$  is transitive.
9. The relation  $R$  is an equivalence relation.
10.  $\mathcal{P}$  is a partition of the set  $A$ .
11. The relation  $f$  is a well-defined function from  $A$  to  $B$ .
12. The domain of the function  $f$ .
13. The codomain of the function  $f$ .
14. The range of the function  $f$ .
15. The image of  $x$  under  $f$ .
16. The pre-image of  $y$  under  $f$ .
17. The identity function on the set  $A$ .
18. The inclusion map of  $A \subseteq B$ .
19. The restriction of a function  $f$  to a subset of its domain.
20. The function  $f$  is a surjection.
21. The function  $f$  is an injection.
22. The function  $f$  is a bijection.
23. The image of a set  $X$  under a function  $f$ .

24. The pre-image of a set  $Y$  under a function  $f$ .
25. The set  $A$  is finite.
26. The set  $A$  is infinite.
27. The set  $A$  has cardinality  $k$  for  $k \in \mathbb{N} \cup \{0\}$ .
28. The set  $A$  is countably infinite.
29. The set  $A$  is countable.
30. The set  $A$  has cardinality  $\aleph_0$ .
31. The set  $A$  is uncountable.
32. The set  $A$  has cardinality  $c$  or  $2^{\aleph_0}$ .