

Worksheet: Functions

This worksheet has questions will help you understand how to understand, write, classify and interpret mathematical functions.

Functions
study guide



Model Answers
to this sheet



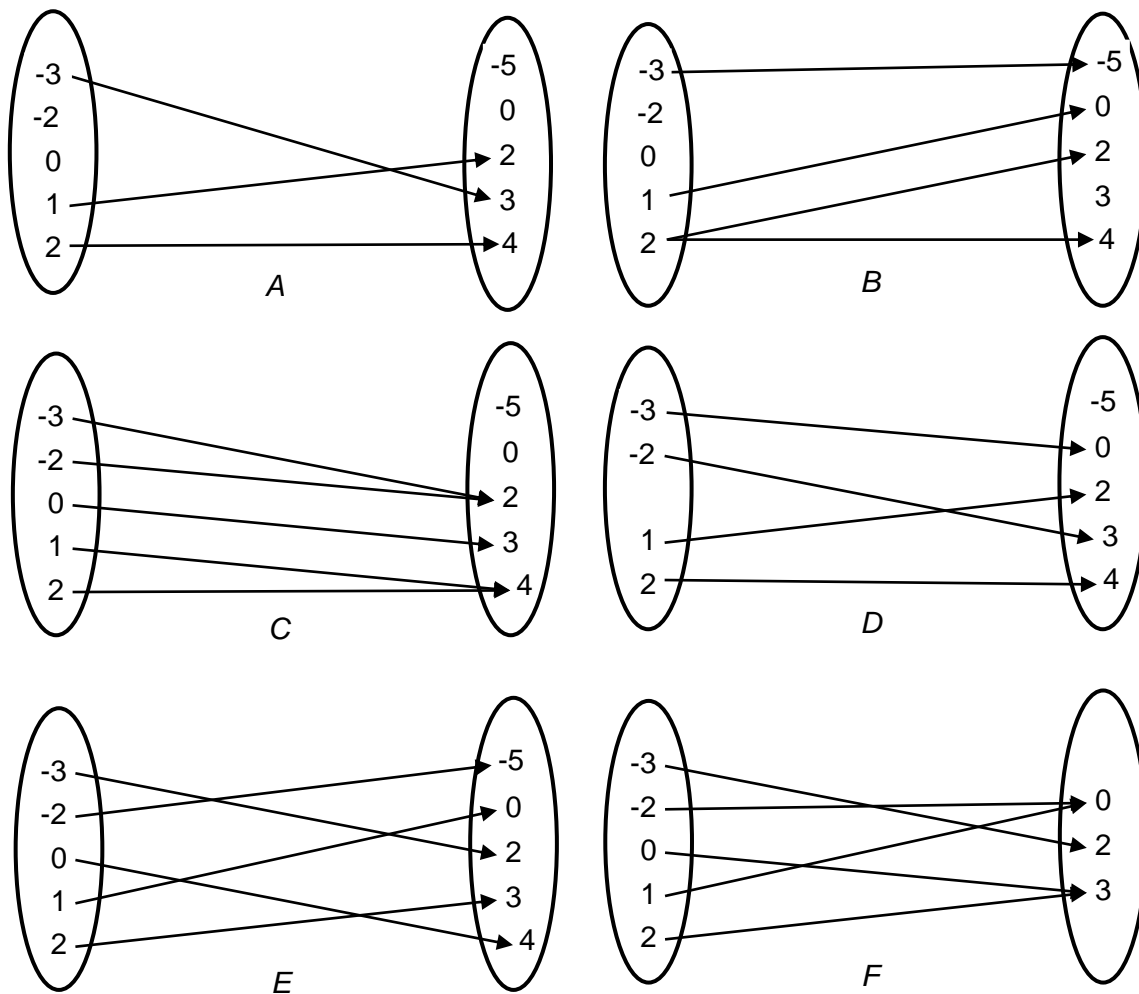
- Four people, Anita, Brian, David and Erica catch the train to London. The train stops at Ipswich, Chelmsford, Manningtree and London. Erica gets off at Ipswich, Anita gets off at Manningtree and Brian and David get off at London.
Using the set of People (P) and the set of stations (S), express this information as a function. What are the domain, co-domain and range of your function? Use a suitable diagram to depict your function.

For the next question you need to know that the natural numbers are the counting numbers 1, 2, 3, 4, ...




- A is the set of natural numbers less than or equal to 5 and B is the set of natural numbers less than 10.
 - The function f is given by $f(x) = x + 3$. Given that $f: A \rightarrow B$ (the function f connects A to B) draw a suitable diagram to depict this function. What are the domain, co-domain and range of f ?
 - The function f is given by $g(x) = 2x - 1$. Given that $g: A \rightarrow B$ (the function g connects A to B) draw a suitable diagram to depict this function. What are the domain, co-domain and range of g ?
 - The function f is given by $h(x) = x$. Given that $h: A \rightarrow B$ (the function h connects A to B) draw a suitable diagram to depict this function. What are the domain, co-domain and range of h ?

It is important that you can identify a piece of mathematics that can be called a function. Some functions also have special properties and can be classified as injective, surjective and bijective.

3. Which of the following diagrams represent functions and why? What are the domain, co-domain and range for those that are functions?



4. Decide whether the **functions** in questions 1, 2 and 3 are injections, surjections, both or neither. Which of the functions are bijections? Which of the functions are invertible?

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