Lesson 8

GCSE Mathematics
Functions I

8.1 Inverse Functions without Flow Diagrams

There is a more mathematical method that can be used to find the inverse of a function.
Using it means solutions are less cluttered.
There are also functions which cannot easily be represented by flow diagrams.
The mathematical method allows their inverses to be found also.

8.2 Example

$$f(x) = \frac{5}{2x} + 6, \quad x \in \mathbb{R}, \quad x \neq 0$$

(i) Determine $f(5)$ **(ii)** Find $f^{-1}(x)$

Teaching Video : http://www.NumberWonder.co.uk/Video/v9002(8).mp4

[4 marks]

(iii) Use your part (i) answer to check your part (ii) answer.

[1 mark]

8.3 Exercise

Marks Available: 48

Question 1

Find the inverse of each of the following functions.

In each case the domain is the set of real numbers, $x \in \mathbb{R}$

(i) $f(x) = 7 - 3x$ **(ii)** $g(x) = 8x + 3$

(iii) $h(x) = \frac{1}{2}x + 5$ **(iv)** $k(x) = \frac{x}{5} - 4$

[12 marks]

Question 2

Find the inverse of each of the following functions.

In each case the domain is the set of real numbers, $x \in \mathbb{R}$

(i) $m(x) = 2(3 - 5x)$

(ii) $n(x) = \dfrac{x - 8}{3}$

(iii) $p(x) = \dfrac{7x}{4}$

(iv) $q(x) = \dfrac{3x}{5} + 4$

[12 marks]

Question 3

Find the inverse of each of the following functions.

In each case the domain is the set of real numbers, $x \in \mathbb{R}$

(i) $r(x) = \frac{x}{11}$

(ii) $s(x) = \frac{1}{4x}, \quad x \neq 0$

(iii) $t(x) = \frac{3}{2x}, \ x \neq 0$

(iv) $u(x) = \frac{1}{x} + 4, \quad x \neq 0$

[12 marks]

Question 4

Find the inverse of each of the following functions.

In each case the domain is the set of real numbers, $x \in \mathbb{R}$

(i) $v(x) = 9 - \frac{1}{x}, \quad x \neq 0$

(ii) $w(x) = 5 - \frac{3}{x}, \quad x \neq 0$

(iii) $z(x) = \frac{2}{x} + 5, \quad x \neq 0$

(iv) $a(x) = \frac{x + 4}{x - 3}, \quad x \neq 3$

[12 marks]