

Functions - Domain and Range

For AQA Level 2 Certificate in Further Mathematics (8365)

Name _____

Total marks: **21**

Answer **all** questions in the spaces provided. Show your working: marks are given for correct method. You may use a calculator.

- 1** $f(x) = 4x - 1$ for $2 \leq x \leq 5$
Circle the range of f .

[1 mark]

$2 \leq f(x) \leq 5$

$7 \leq x \leq 19$

$7 \leq f(x) \leq 19$

$7 < f(x) < 19$

- 2** (a) The function f is defined by $f(x) = 9 - 2x$ for $-1 < x \leq 4$
Work out the range of f .

[2 marks]

Answer _____

- (b) $h(x) = 10 - 4x$
The range of h is $-6 \leq h(x) < 2$
Work out the domain of h .

[2 marks]

Answer _____

3 $f(x) = \frac{5}{2x+3}$

f is defined for all values of x except $x = k$
Write down the value of k .

[1 mark]

$k =$ _____

4 $f(x) = (x+1)^2 - 4$

The domain of f is $-3 < x \leq 2$

Work out the range of f .

[2 marks]

Answer _____

5 $g(x) = 5 - x^2$ for $-2 \leq x < 3$
Work out the range of g .

[2 marks]

Answer _____

6 A function h has domain $-2 \leq x < 3$, where $h(x) = 1 - x^3$
Work out the range of h .

[2 marks]

Answer _____

- 7 $f(x) = 2x^2 - 1$, where $x > 0$
For a smaller domain, the range of f is $7 < f(x) \leq 49$
Work out this domain.

[2 marks]

Answer _____

- 8 $h(x) = a \times b^{-x}$ for $-2 \leq x \leq 3$
 a and b are positive constants.
The graph of $y = h(x)$ passes through $(-1, 24)$ and $(2, 3)$
Work out the range of h .

[4 marks]

Answer _____

- 9 $f(x) = x^2 - 8x + k$ for $1 \leq x \leq 10$, where k is a constant.
The range of f is $3 \leq f(x) \leq q$
Work out the values of k and q .

[3 marks]

$k =$ _____ $q =$ _____