

Functions Worksheet

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Questions in past papers often come up combined with other topics.
Topic tags have been given for each question to enable you to know if you can do the question or whether you need to wait to cover the additional topic(s).

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Qualification: IGCSE Edexcel A Higher

Areas: Functions

Subtopics: Domain of Functions, Composite Functions

Paper: Paper-2H / Series: 2019-January / Difficulty: Easy / Question Number: 17

17 f is the function such that $f(x) = 4 - 3x$

(a) Work out $f(5)$

.....
(1)

g is the function such that $g(x) = \frac{1}{1-2x}$

(b) Find the value of x that cannot be included in any domain of g

.....
(1)

(c) Work out $fg(-1.5)$

.....
(2)

(Total for Question 17 is 4 marks)

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Qualification: GCSE Edexcel Higher

Areas: Functions

Subtopics: Substitution, Functions With Algebra

Paper: Paper-2H-Calculator / Series: Specimen-Set-1 / Difficulty: Easy / Question Number: 18

18 $f(x) = 3x^2 - 2x - 8$

Express $f(x + 2)$ in the form $ax^2 + bx$

(Total for Question 18 is 3 marks)

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Qualification: GCSE Edexcel Higher

Areas: Functions

Subtopics: Substitution, Inverse Functions, Composite Functions

Paper: Paper-2H-Calculator / Series: Specimen-Set-2 / Difficulty: Medium / Question Number: 9

9 The functions f and g are such that

$$f(x) = 3(x - 4) \text{ and } g(x) = \frac{x}{5} + 1$$

(a) Find the value of $f(10)$

(1)

(b) Find $g^{-1}(x)$

$$g^{-1}(x) = \dots$$

(c) Show that $ff(x) = 9x - 48$

(2)

(Total for Question 9 is 5 marks)

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Qualification: GCSE Edexcel Higher

Areas: Functions

Subtopics: Substitution, Composite Functions, Inverse Functions

Paper: Paper-3H-Calculator / Series: 2024-June / Difficulty: Medium / Question Number: 16

16 The functions f and g are given by

$$f(x) = \frac{12}{x+1} \quad \text{and} \quad g(x) = 5 - 3x$$

(a) Find $f(-3)$

.....
(1)

(b) Find $fg(1)$

.....
(2)

(c) Find $g^{-1}(4)$

.....
(2)

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(Total for Question 16 is 5 marks)



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Qualification: IGCSE Edexcel A Higher

Areas: Functions

Subtopics: Domain of Functions, Composite Functions, Inverse Functions

Paper: Paper-2H / Series: 2021-November / Difficulty: Medium / Question Number: 15

15 The functions f and g are such that

$$f(x) = 2x - 3$$

$$g(x) = \frac{x}{3x + 1}$$

(a) State the value of x that cannot be included in any domain of g

.....
(1)

(b) Find $gf(x)$

Simplify your answer.

$$gf(x) = \dots$$

(2)

(c) Express the inverse function g^{-1} in the form $g^{-1}(x) = \dots$

$$g^{-1}(x) = \dots$$

(3)

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(Total for Question 15 is 6 marks)

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Qualification: IGCSE Edexcel A Higher

Areas: Functions

Subtopics: Domain of Functions, Composite Functions, Inverse Functions, Substitution

Paper: Paper-1HR / Series: 2020-November / Difficulty: Medium / Question Number: 16

16 The functions f and g are defined as

$$f:x \mapsto 5x - 7$$

$$g:x \mapsto \frac{5x}{x+4}$$

(a) Write down the value of x that must be excluded from any domain of g

.....
(1)

(b) Find $gf(2.6)$

.....
(2)

(c) Solve $fg(x) = 2$

$x =$
(3)

(d) Express the inverse function g^{-1} in the form $g^{-1}:x \mapsto \dots$

$g^{-1}:x \mapsto$
(3)

(Total for Question 16 is 9 marks)

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Qualification: IGCSE Edexcel A Higher

Areas: Functions

Subtopics: Substitution, Inverse Functions

Paper: Paper-1H / Series: 2022-June / Difficulty: Medium / Question Number: 14

14 The function f is defined as

$$f:x \mapsto \frac{2x}{x-6} \quad x \neq 6$$

(a) Find $f(10)$

.....
(1)

(b) Express the inverse function f^{-1} in the form $f^{-1}:x \mapsto \dots$

$$f^{-1}:x \mapsto \dots$$

(3)

(Total for Question 14 is 4 marks)

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Qualification: IGCSE Edexcel A Higher

Areas: Functions

Subtopics: Domain of Functions, Composite Functions, Substitution, Functions With Algebra

Paper: Paper-1H / Series: 2023-June / Difficulty: Medium / Question Number: 17

17 The functions g and h are such that

$$g(x) = \frac{11}{2x - 5}$$

$$h(x) = x^2 + 4 \quad x \geq 0$$

(a) What value of x must be excluded from any domain of g ?

.....
(1)

(b) Solve $gh(x) = 1$

.....
(3)

(Total for Question 17 is 4 marks)

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Qualification: GCSE Edexcel Higher

Areas: Functions

Subtopics: Inverse Functions, Composite Functions, Substitution

Paper: Paper-3H-Calculator / Series: Sample-Set-2 / Difficulty: Medium / Question Number: 10

10 The function f is such that

$$f(x) = 4x - 1$$

(a) Find $f^{-1}(x)$

$$f^{-1}(x) = \dots \quad (2)$$

The function g is such that

$$g(x) = kx^2 \text{ where } k \text{ is a constant.}$$

Given that $fg(2) = 12$

(b) work out the value of k

$$k = \dots \quad (2)$$

(Total for Question 10 is 4 marks)

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Qualification: GCSE Edexcel Higher

Areas: Functions

Subtopics: Substitution, Composite Functions, Inverse Functions

Paper: Paper-2H-Calculator / Series: 2023-November / Difficulty: Somewhat Challenging / Question Number: 19

19 The functions f and g are such that

$$f(x) = (2x + 3)^2 \quad \text{and} \quad g(x) = 2x - 1$$

(a) Find $gf(-3)$

.....
(2)

(b) Find $g^{-1}(x)$

$$g^{-1}(x) = \dots$$

(2)

(Total for Question 19 is 4 marks)

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Qualification: IGCSE Edexcel A Higher

Areas: Functions

Subtopics: Inverse Functions, Completing The Square, Rearranging

Paper: Paper-1H / Series: 2021-January / Difficulty: Somewhat Challenging / Question Number: 22

22 The function f is such that $f(x) = x^2 - 8x + 5$ where $x \leq 4$

Express the inverse function f^{-1} in the form $f^{-1}(x) = \dots$

$$f^{-1}(x) = \dots$$

(Total for Question 22 is 3 marks)

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Qualification: IGCSE Edexcel A Higher

Areas: Functions

Subtopics: Inverse Functions, Domain of Functions, Completing The Square

Paper: Paper-2H / Series: 2022-January / Difficulty: Somewhat Challenging / Question Number: 25

25 The function g is defined as

$$g: x \mapsto 5 + 6x - x^2 \quad \text{with domain } \{x: x \geq 3\}$$

(a) Express the inverse function g^{-1} in the form $g^{-1}: x \mapsto \dots$

$$g^{-1}: x \mapsto \dots \quad (4)$$

(b) State the domain of g^{-1}

.....
(1)

(Total for Question 25 is 5 marks)

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Qualification: IGCSE Edexcel A Higher

Areas: Functions

Subtopics: Inverse Functions, Domain and Range of Inverse Functions

Paper: Paper-1H / Series: 2019-January / Difficulty: Somewhat Challenging / Question Number: 19

19 g is the function with domain $x \geq -3$ such that $g(x) = x^2 + 6x$

(a) Write down the range of g^{-1}

.....
(1)

(b) Express the inverse function g^{-1} in the form $g^{-1} : x \mapsto \dots$

$g^{-1} : x \mapsto \dots$
(4)

(Total for Question 19 is 5 marks)

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Qualification: IGCSE Edexcel A Higher

Areas: Functions

Subtopics: Composite Functions, Inverse Functions, Completing The Square

Paper: Paper-1H / Series: 2021-June / Difficulty: Somewhat Challenging / Question Number: 24

24 The functions f and g are defined as

$$f(x) = 5x^2 - 10x + 7 \quad \text{where } x \geq 1$$

$$g(x) = 7x - 6$$

(a) Find $fg(2)$

.....
(2)

(b) Express the inverse function f^{-1} in the form $f^{-1}(x) = \dots$

$$f^{-1}(x) = \dots \quad (4)$$

(Total for Question 24 is 6 marks)

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Qualification: IGCSE Edexcel A Higher

Areas: Functions

Subtopics: Composite Functions, Inverse Functions

Paper: Paper-1HR / Series: 2018-June / Difficulty: Somewhat Challenging / Question Number: 20

20 Two functions, f and g are defined as

$$f : x \mapsto 1 + \frac{1}{x} \quad \text{for } x > 0$$

$$g : x \mapsto \frac{x+1}{2} \quad \text{for } x > 0$$

Given that $h = fg$

express the inverse function h^{-1} in the form $h^{-1} : x \mapsto \dots$

$$h^{-1} : x \mapsto \dots$$

(Total for Question 20 is 4 marks)

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Qualification: IGCSE Edexcel A Higher

Areas: Functions

Subtopics: Domain of Functions, Composite Functions, Inverse Functions, Completing The Square

Paper: Paper-2H / Series: 2023-November / Difficulty: Somewhat Challenging / Question Number: 19

19 The functions f and g are such that

$$f:x \mapsto 5x + 7$$

$$g:x \mapsto \frac{5}{2x-9}$$

(a) State which value of x cannot be included in any domain of g

.....
(1)

(b) Find $fg(4)$

.....
(2)

The function h is such that

$$h:x \mapsto 3x^2 - 12x + 8 \quad \text{where } x > 2$$

(c) Express the inverse function h^{-1} in the form $h^{-1}:x \mapsto \dots$

$$h^{-1}:x \mapsto \dots \quad (4)$$

(Total for Question 19 is 7 marks)

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Qualification: GCSE Edexcel Higher

Areas: Functions

Subtopics: Composite Functions, Substitution, Fractions - Arithmetic, Fractions

Paper: Paper-1H-Non-Calculator / Series: Sample-Set-1 / Difficulty: Somewhat Challenging / Question Number: 12

12 The functions f and g are such that

$$f(x) = 1 - 5x \quad \text{and} \quad g(x) = 1 + 5x$$

(a) Show that $gf(1) = -19$

(2)

(b) Prove that $f^{-1}(x) + g^{-1}(x) = 0$ for all values of x .

(3)

(Total for Question 12 is 5 marks)

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Qualification: IGCSE Edexcel A Higher

Areas: Functions

Subtopics: Composite Functions, Inverse Functions, Domain of Functions

Paper: Paper-1H / Series: 2020-January / Difficulty: Hard / Question Number: 21

21 The functions f and g are such that

$$f(x) = x^2 - 2x \quad g(x) = x + 3$$

The function h is such that $h(x) = fg(x)$ for $x \geq -2$

Express the inverse function $h^{-1}(x)$ in the form $h^{-1}(x) = \dots$

$$h^{-1}(x) = \dots$$

(Total for Question 21 is 5 marks)

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Qualification: GCSE Edexcel Higher

Areas: Functions

Subtopics: Inverse Functions, Composite Functions, Functions With Algebra

Paper: Paper-1H-Non-Calculator / Series: 2019-June / Difficulty: Hard / Question Number: 21

21 The functions f and g are such that

$$f(x) = 3x - 1 \quad \text{and} \quad g(x) = x^2 + 4$$

(a) Find $f^{-1}(x)$

$$f^{-1}(x) = \dots$$

(2)

Given that $fg(x) = 2gf(x)$,

(b) show that $15x^2 - 12x - 1 = 0$

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(Total for Question 21 is 7 marks)



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Qualification: IGCSE Edexcel A Higher

Areas: Functions

Subtopics: Composite Functions, Inequalities - Forming Quadratics, Inequalities - Solving Quadratic

Paper: Paper-2HR / Series: 2022-June / Difficulty: Hard / Question Number: 19

19 $f(x) = x^2 - 4$

$g(x) = 2x + 1$

Solve $fg(x) > 0$

Show clear algebraic working.

(Total for Question 19 is 4 marks)

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