Name:		

IGCSE

Functions

Instructions

- Use black ink or ball-point pen.
- Answer all questions.
- Answer the questions in the spaces provided
- there may be more space than you need.
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- You must show all your working out.

Information

- The marks for each question are shown in brackets
- use this as a guide as to how much time to spend on each question.

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end

January 2019 Paper 1H Question 19

- g is the function with domain $x \ge -3$ such that $g(x) = x^2 + 6x$
 - (a) Write down the range of g⁻¹

$$g^{-\prime}(x) \gg -3 \tag{1}$$

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

$$g(x) = (x + 3)^{2} - 9$$

$$y = (x + 3)^{2} - 9$$

$$y + 9 = (x + 3)^{2}$$

$$\sqrt{y + 9} = x + 3$$

$$(\sqrt{y + 9}) - 3 = x$$

$$g'(x) = \sqrt{2 + 9} - 3$$

$$= -3 + \sqrt{x + 9}$$

$$g^{-1}: X \to -3 + \sqrt{x+9}$$

$$\tag{4}$$

(Total for Question 1 is 5 marks)

June 2019 Paper 2H Question 24

- 2 The function f is such that f(x) = 3x 2
 - (a) Find f(5)

$$f(5) = 3(5) - 2$$
= 13

(1)

The function g is such that $g(x) = 2x^2 - 20x + 9$ where $x \ge 5$

(b) Express the inverse function g^{-1} in the form $g^{-1}(x) = ...$

$$g(x) = 2(x^{2} - 10x) + 9$$

$$= 2[(x - 5)^{2} - 25] + 9$$

$$= 2(x - 5)^{2} - 50 + 9$$

$$= 2(x - 5)^{2} - 4$$

$$y = 2(x-5)^{2} - 41$$

$$\chi = 2(y-5)^{2} - 41$$

$$\chi = 2(y-5)^{2} - 41$$

$$\chi = 2(y-5)^{2}$$

$$\chi = 3 + 41$$

$$\chi = 41 - (y-5)^{2}$$

$$\chi = 3 + 41$$

$$\chi = 41 - (y-5)^{2}$$

$$\chi = 3 + 41$$

$$\chi = 41 - (y-5)^{2}$$

$$\chi = 3 + 41$$

$$\chi = 41 - (y-5)^{2}$$

$$\chi = 3 + 41$$

$$\chi = 41 - (y-5)^{2}$$

$$\chi = 3 + 41$$

$$\chi = 41 - (y-5)^{2}$$

$$\chi = 41 - (y-5)^{2}$$

$$\chi = 3 + 41$$

$$\chi = 41 - (y-5)^{2}$$

$$\chi = 3 + 41$$

$$\chi = 41 - (y-5)^{2}$$

$$\chi = 3 + 41$$

$$\chi = 41 - (y-5)^{2}$$

$$\chi = 41 - (y-$$

(Total for Question 2 is 5 marks)

May 2018 Paper 1H Question 14

3 The function f is such that

$$f(x) = \frac{3x - 2}{4}$$

(a) Find f(-7)

$$f(-7) = \frac{3(-7)-2}{4}$$

- 5.75

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

$$y = \frac{3x - 2}{4}$$

$$4y + 2 = 3x$$

$$\frac{4y+2}{3}=x$$

$$f^{-1}(z) = \frac{4z+2}{3}$$

$$f^{-1}(x) = \frac{4x + 2}{3}$$

(2)

The function g is such that

$$g(x) = \sqrt{19 - x}$$

(c) Find fg(3)
$$g(3) = \sqrt{19-3} = \sqrt{16} = 4$$

$$f(4) = \frac{3(4) - 2}{4} = \frac{10}{4} = \frac{5}{2}$$

2.5

(2)

(d) Which values cannot be included in any domain of g?

x > 19

(2)

(Total for Question 3 is 7 marks)

Sample Paper 2H Question 17

The function f is such that

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

(a) Find f(1)

$$f(1) = \frac{3}{1-2}$$

(1)

(b) State which value of *x* must be excluded from any domain of f

(1)

The function g is such that g(x) = x + 4

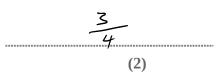
(c) Calculate fg(2)

$$g(2) = 2 + 4$$

= 6
 $f(6) = \frac{3}{6 - 2}$

$$f(6) = \frac{3}{6 \cdot 2}$$

$$= \frac{3}{4}$$



(Total for Question 4 is 4 marks)