A2 Maths Summer Homework

1) The function f is defined by

$$f\colon x \mapsto \frac{5x+1}{x^2+x-2} - \frac{3}{x+2}, \quad x > 1.$$

(a) Show that $f(x) = \dfrac{2}{x-1}, \quad x > 1.$

(4)

(b) Find $f^{-1}(x)$.

(3)

The function g is defined by

$$g\colon x \mapsto x^2 + 5, \quad x \in \mathbb{R}.$$

(b) Solve $fg(x) = \frac{1}{4}$.

(3)

2) The functions f and g are defined by

$$f\colon x \mapsto 1 - 2x^3, \quad x \in \mathbb{R}.$$

$$g\colon x \mapsto \frac{3}{x} - 4, \quad x > 0, \ x \in \mathbb{R}.$$

(a) Find the inverse function f^{-1}.

(2)

(b) Show that the composite function gf is

$$gf\colon x \mapsto \frac{8x^3 - 1}{1 - 2x^3}.$$

(4)

(c) Solve $gf(x) = 0$.

(2)

7. The function f is defined by

$$f\colon x \mapsto \frac{3(x+1)}{2x^2+7x-4} - \frac{1}{x+4}, \qquad x \in \mathbb{R}, x > \frac{1}{2}$$

(a) Show that $f(x) = \dfrac{1}{2x-1}$

(4)

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

(3)

(c) Find the domain of f^{-1}

(1)