Functions – 2022 Nov IGCSE 0606 Additional Math

1. Nov/2022/Paper_0606_11/No.13

Given that $f''(x) = 6(3x+4)^{-\frac{1}{2}}$, $f'(4) = 18$ and $f(4) = \frac{512}{9}$, find $f(x)$. [8]

2. Nov/2022/Paper_0606_12/No.8

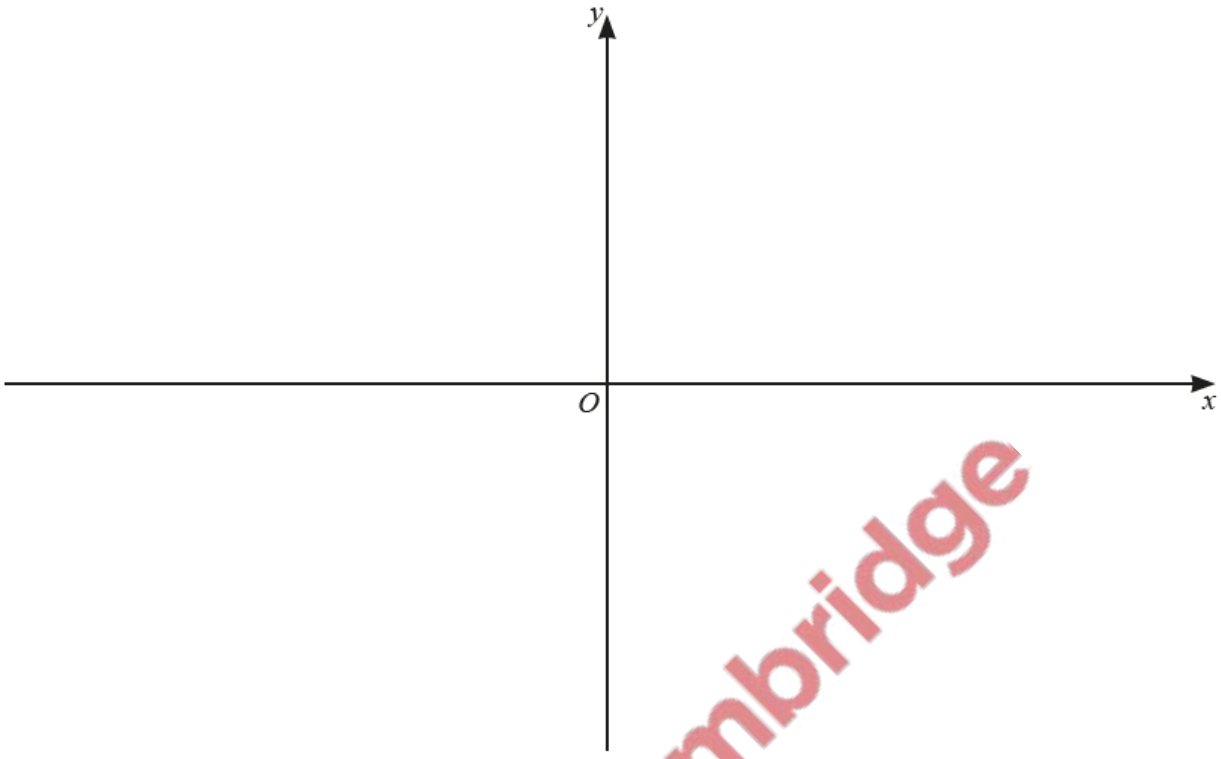
A function $f(x)$ is such that $f(x) = \ln(2x+3) + \ln 4$, for $x > a$, where a is a constant.

(a) Write down the least possible value of a. [1]

(b) Using your value of a, write down the range of f. [1]

(c) Using your value of a, find $f^{-1}(x)$, stating its range. [4]

(d) On the axes below, sketch the graphs of $y = \mathrm{f}(x)$ and $y = \mathrm{f}^{-1}(x)$, stating the exact intercepts of each graph with the coordinate axes. Label each of your graphs. [4]



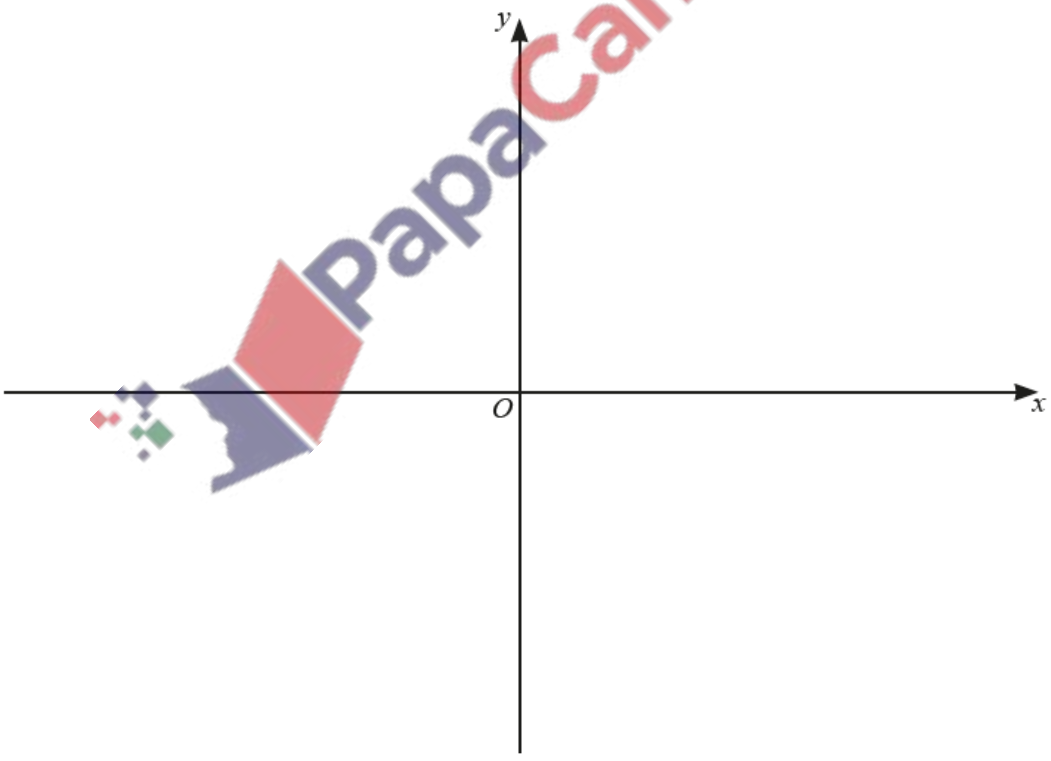
3. Nov/2022/Paper_0606_13/No.6

A function $f(x)$ is such that $f(x) = e^{3x} - 4$, for $x \in \mathbb{R}$.

(a) Find the range of f. [1]

(b) Find an expression for $f^{-1}(x)$. [2]

(c) On the axes, sketch the graphs of $y = f(x)$ and $y = f^{-1}(x)$ stating the exact values of the intercepts with the coordinate axes. [4]



4. Nov/2022/Paper_0606_21/No.9

The functions $f(x)$ and $g(x)$ are defined as follows for $x > -\frac{1}{3}$ by

$$f(x) = x^2 + 1,$$
$$g(x) = \ln(3x+2).$$

(a) Find $fg(x)$. [1]

(b) Solve the equation $fg(x) = 5$ giving your answer in exact form. [3]

(c) Solve the equation $\mathrm{gg}(x) = 1$. [6]