Functions – 2020 IGCSE 0444

1. Nov/2020/Paper_13/No.9

$$f(x) = 4x + 3$$

Find the value of f(0).

..... [1]

2. Nov/2020/Paper_13/No.12

$g(x) = 8x$

(a) Solve $g(x) = 5$.

$x =$ ..... [1]

(b) Solve $g(x) + 2 = 10x$.

$x =$ ..... [2]

3. Nov/2020/Paper_43/No.10

$f(x) = 4 - 3x$ $g(x) = x^2 + x$ $h(x) = 3^x$

(a) Find $f(h(2))$.

..... [2]

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

$f^{-1}(x) =$ ..... [2]

(c) Simplify.

(i) $f(1 - 2x)$

..... [2]

(ii) $g(f(x)) - 9g(x)$

..... [4]

(d) $\frac{1}{\mathrm{h}(x)} = 9^{kx}$

Find the value of k.

$k =$ ..... [2]

(e) $\mathrm{j}(x) = (x+1)(x+2)$

The graph of $\mathrm{g}(x)$ is mapped onto the graph of $\mathrm{j}(x)$ by a translation.

Find the column vector that represents this translation.

$\begin{pmatrix} \quad \\ \quad \end{pmatrix}$ [2]

4. June/2020/Paper_21/No.14

(a) $f(x) = 4x+3$ $g(x) = 5x-4$

$f(g(x)) = 20x+p$

Find the value of p.

$p =$ ..... [2]

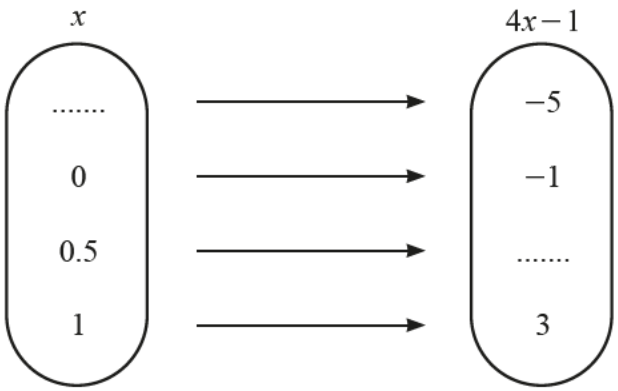
(b) $h(x) = \frac{5x-1}{3}$

Find $h^{-1}(x)$.

$h^{-1}(x) =$ ..... [3]

5. June/2020/Paper_31/No.9

(a) **(i)** Complete the mapping diagram for the function $f: x \to 4x - 1$.

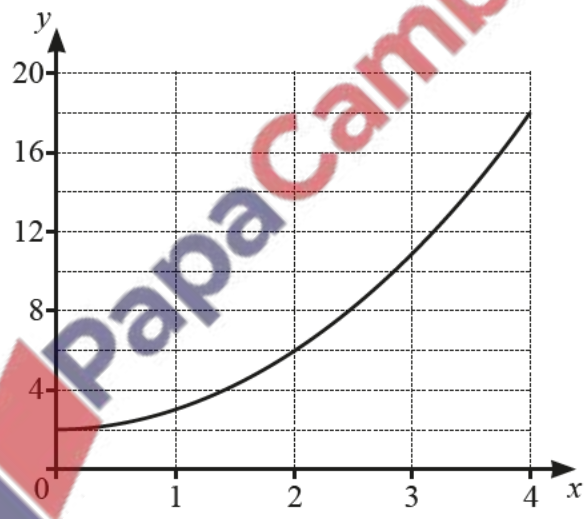


[2]

(ii) Write down the domain of the function f.

..... [1]

(b)

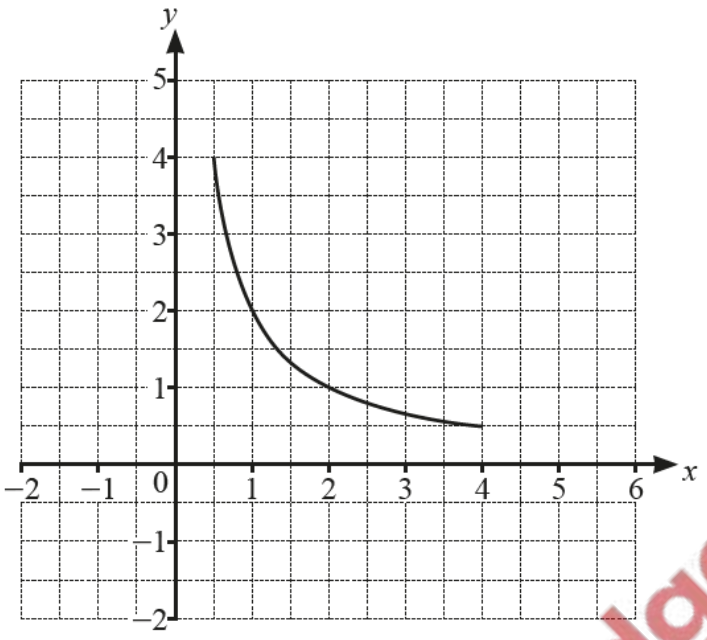


The diagram shows the graph of the function $y = g(x)$ where $g(x) = x^2 + 2$ for $0 \leqslant x \leqslant 4$.

Complete the range of $g(x)$.

..... $\leqslant g \leqslant$ ..... [2]

(c)

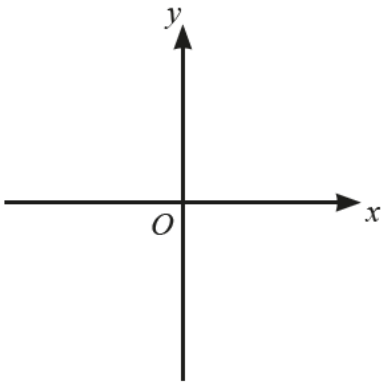


The graph of $y = \mathrm{h}(x)$ is shown on the grid.

On this grid, draw the graph of $y = \mathrm{h}(x-1)$. [2]

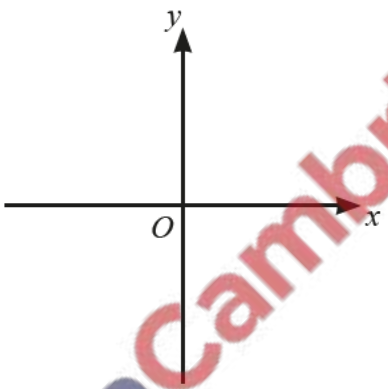
6. June/2020/Paper_41/No.11

(a)



On the diagram, sketch the graph of $y = 2^x$. [1]

(b)



On the diagram, sketch the graph of $y = 0.9^x$. [1]

(c) Find the exact value of x when $2^x = \frac{1}{4\sqrt{2}}$.

$x =$ ..... [2]

(d) **(i)** $f(x) = 3(1.04)^x$

$f(x)$ is an exponential function representing a rate of increase of r%.

Find the value of r.

$r =$ ..... [1]

(ii) $g(x)$ is an exponential function representing a rate of decrease of 2%.
$g(0) = 7$

Find $g(x)$, giving your answer in its simplest form.

$g(x) =$ ..... [2]