Functions – 2021 IGCSE 0444

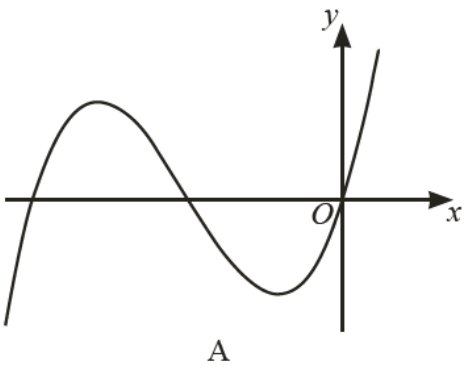
1. Nov/2021/Paper_43/No.9

(a) $f(x) = x(x-1)(x-2)$

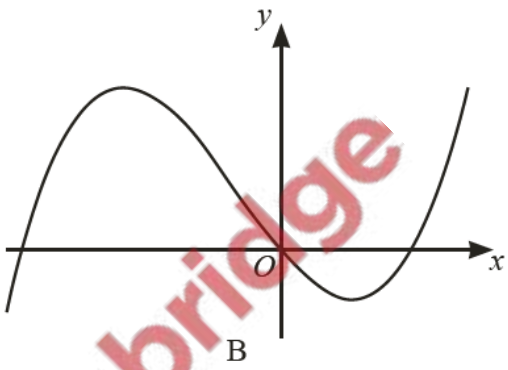
(i) Find the coordinates of the points where the graph of $y = f(x)$ crosses the x-axis.

(..... , ...) (..... , ...) (..... , ...) [2]

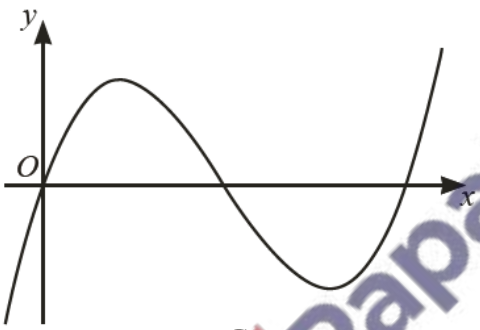
(ii)



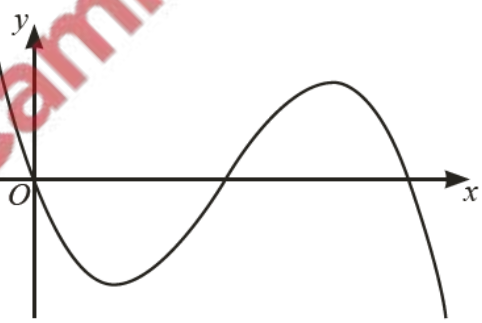
A



B



C

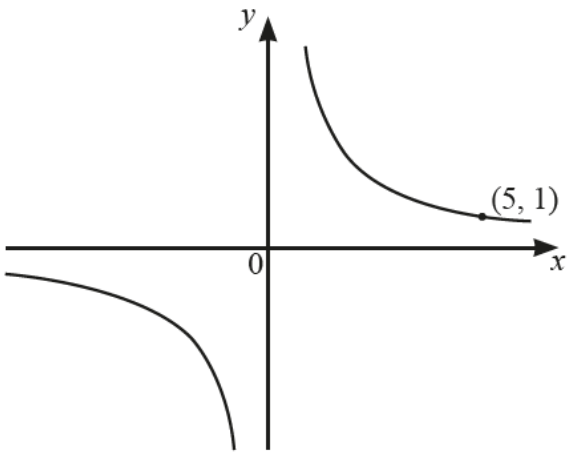


D

Which of the sketches shows the graph of $y = f(x)$?

..... [1]

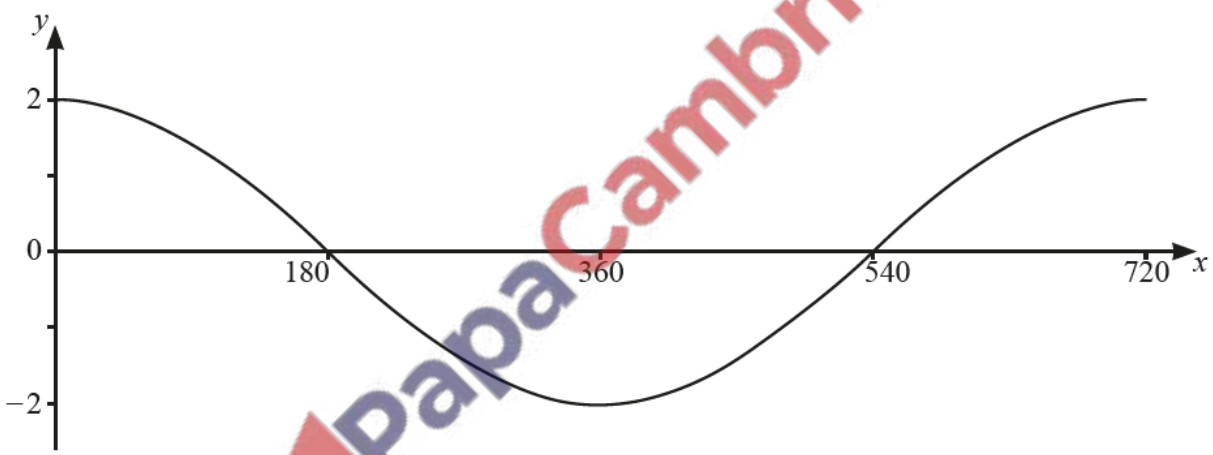
(b) The diagram shows a sketch of the graph of $y = g(x)$.



Find $g(x)$.

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

(c)



The graph shows the function $h(x) = a\cos(bx)$ for $0° \leqslant x \leqslant 720°$.

(i) Complete the range of $h(x)$.

..... $\leqslant h(x) \leqslant$ ..... [1]

(ii) Find the value of a and the value of b.

$a =$ .....

$b =$ ..... [2]

(d) Describe fully the **single** transformation that maps the graph of $y = \mathrm{j}(x)$ onto the graph of

(i) $y = \mathrm{j}(x-5)$,

.....

..... [2]

(ii) $y = 5\mathrm{j}(x)$.

.....

..... [3]

2. Nov/2021/Paper_43/No.11

$f(x) = 2x - 1$ $g(x) = x^2 + 2x$ $h(x) = 4^x$ $j(x) = 2^x$

(a) Find the value of

(i) h(3),

..... [1]

(ii) f(h(3)).

..... [1]

(b) Solve the equation $g(f(x)) = 0$.

$x =$ ..... or $x =$ ..... [4]

(c) $p^{-1}(x) = f(x)$

Find $p(x)$.

..... [2]

(d) $\mathrm{h}(x)\mathrm{j}(x) = \dfrac{1}{\sqrt{2}}$

Find the value of x.

$x =$ ..... [3]

3. June/2021/Paper_41/No.11

$f(x) = 3 - 2x$ $g(x) = x^2 + 5$ $h(x) = x^3$ $j(x) = 3^x$

(a) Find $f(5)$.

..... [1]

(b) Find $f(j(5))$.

..... [2]

(c) Find $f(f(x))$.
Give your answer in its simplest form.

..... [2]

(d) Solve $g(x) = f(x) + 7$.
Give your answers in the form $p \pm q\sqrt{6}$.

..... [4]

(e) **(i)** Find $f^{-1}(x)$.

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

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

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

(f) Find x when $j^{-1}(x) = -2$.

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