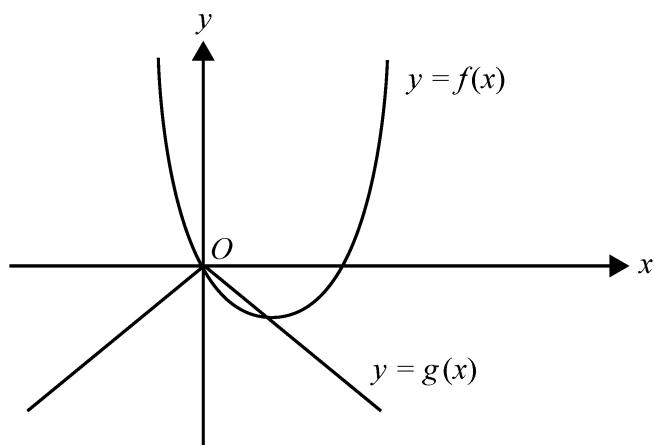


**UNIT 3 & 4 MATHEMATICAL METHODS
VCAA EXAMINATION 2 – 2006 TO 2017**

**FUNCTIONS & GRAPHS – OTHER FUNCTIONS
MULTIPLE CHOICE QUESTIONS**

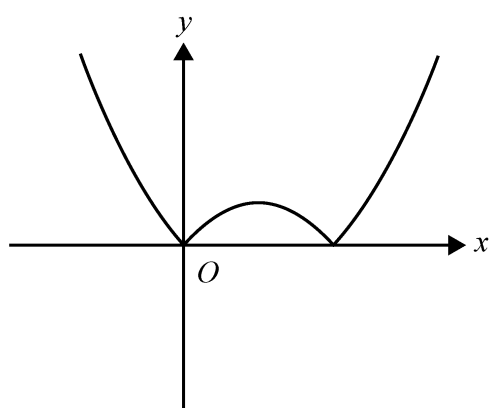
QUESTION 1 – 2007 (HARD)

The graphs of $y = f(x)$ and $y = g(x)$ are as shown.

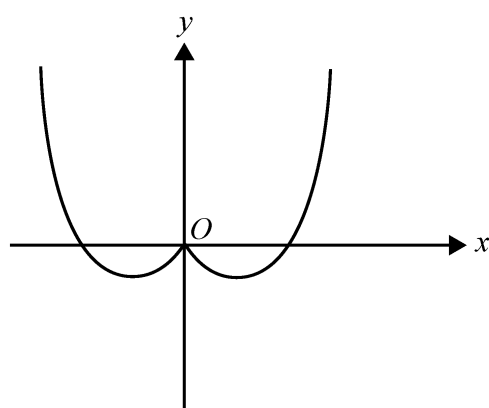


The graph of $y = f(g(x))$ is best represented by

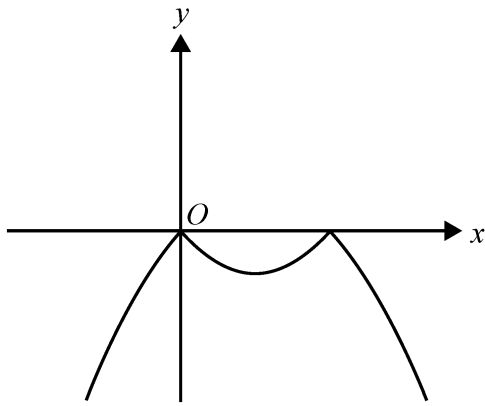
A.



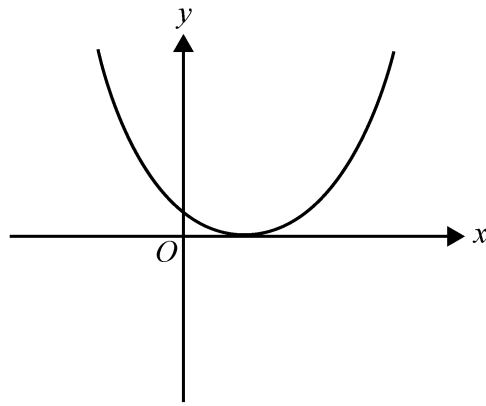
B.



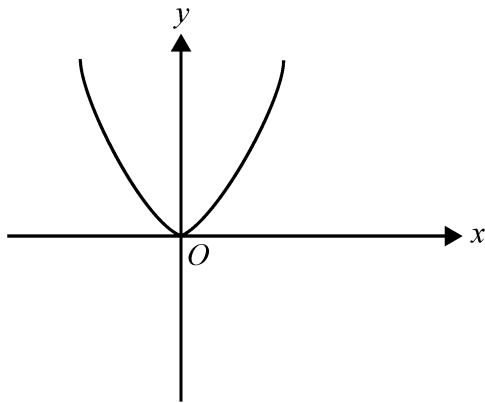
C.



D.

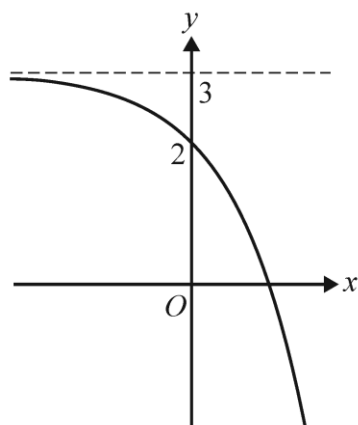


E.



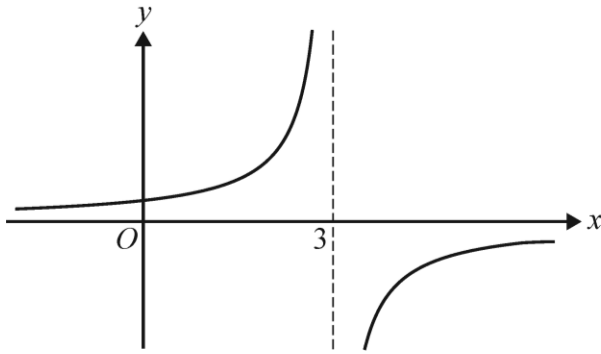
QUESTION 2 – 2013 (EASY)

Part of the graph of $y = f(x)$, where $f: \mathbb{R} \rightarrow \mathbb{R}$, $f(x) = 3 - e^x$, is shown below.

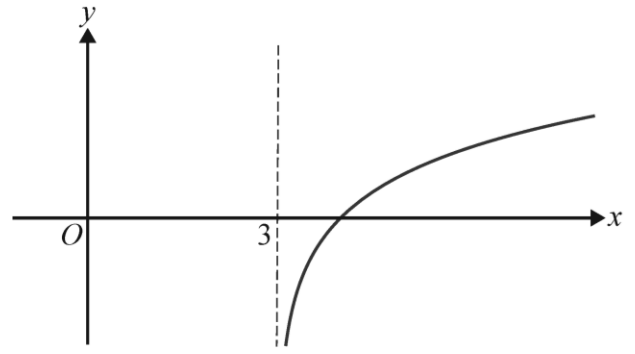


Which one of the following could be the graph of $y = f^{-1}(x)$, where f^{-1} is the inverse of f ?

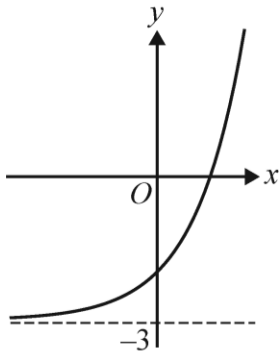
A.



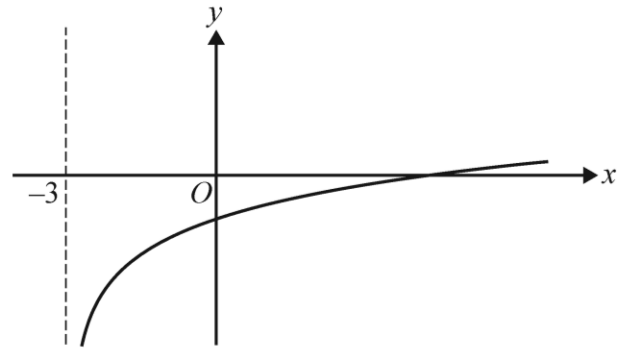
B.



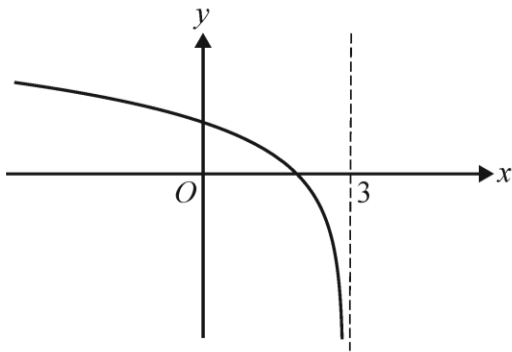
C.



D.

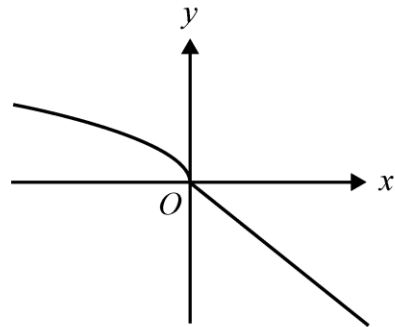


E.



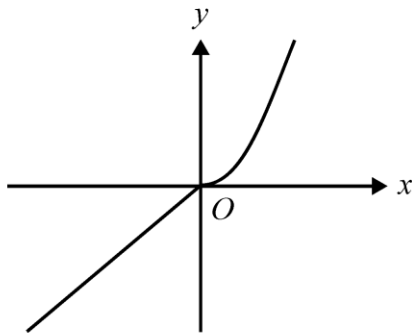
QUESTION 3 – 2015 (AVERAGE)

Part of the graph of $y = f(x)$ is shown below.

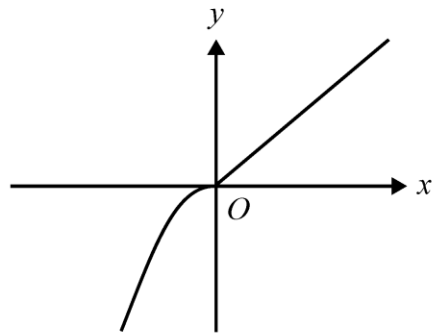


The corresponding part of the graph of the inverse function $y = f^{-1}(x)$ is best represented by

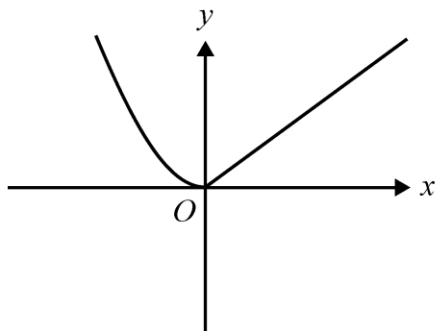
A.



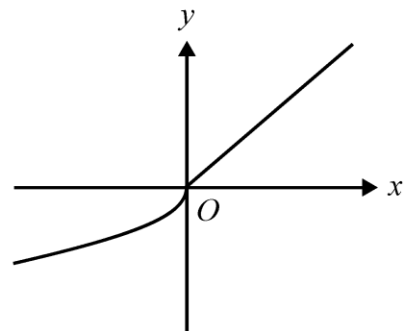
B.



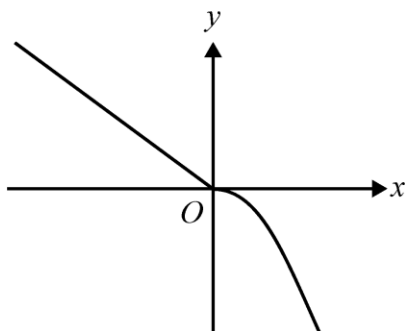
C.



D.

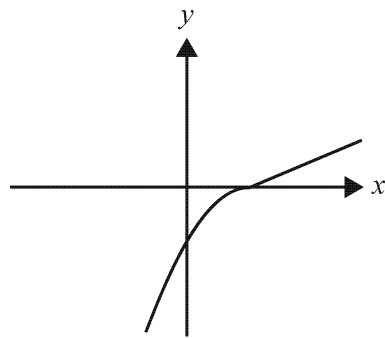


E.

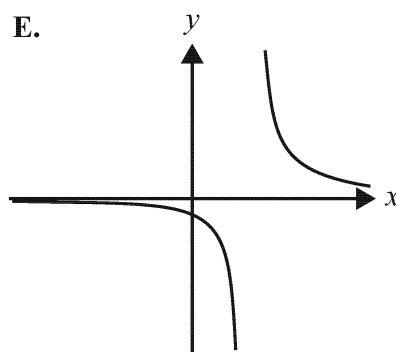
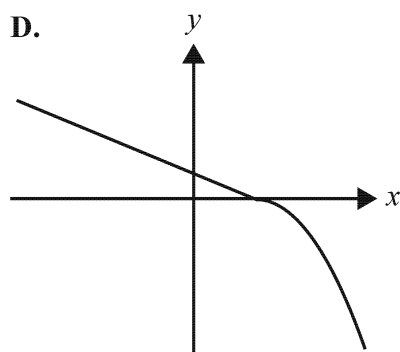
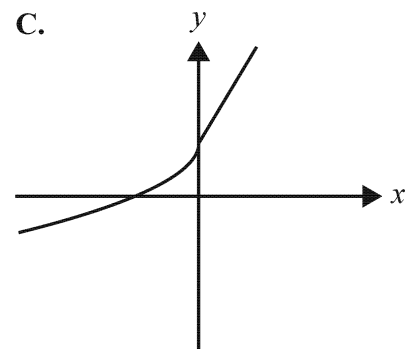
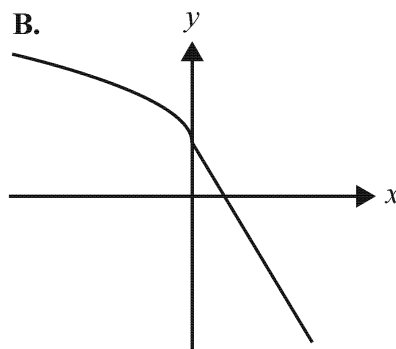
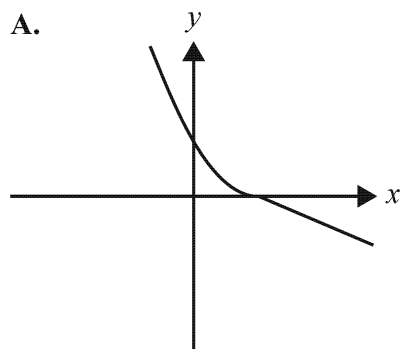


QUESTION 4 – 2017

Part of the graph of the function f is shown below. The same scale has been used on both axes.

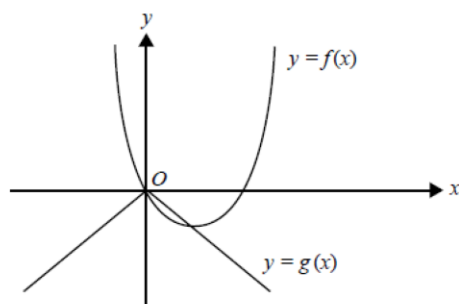


The corresponding part of the graph of the inverse function f^{-1} is best represented by



SOLUTIONS

QUESTION 1

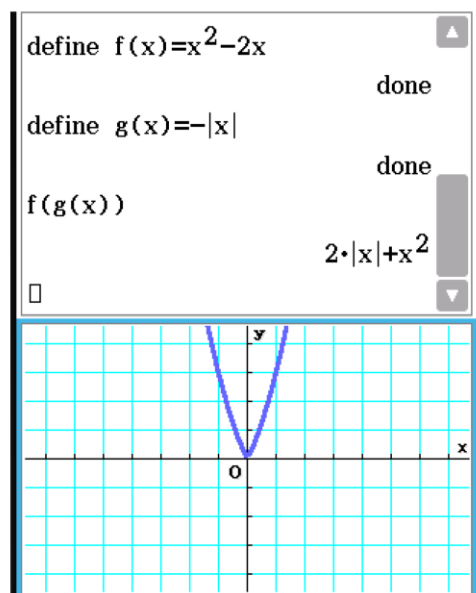


One approach is to approximate the equations for:

$$f(x) = x(x-2) = x^2 - 2x$$

$$g(x) = -|x|$$

$y = f(g(x))$ could be represented by the graph below:

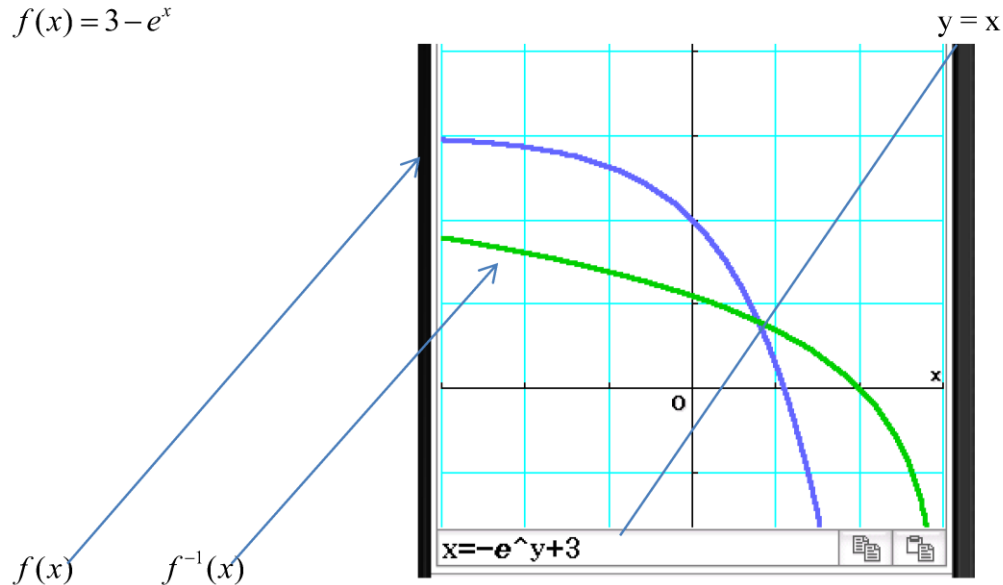


Answer is E

Difficulty: 37% of Students Answered this Question Correctly

QUESTION 2

$$f(x) = 3 - e^x$$



Inverse can be sketched using CAS technology.

Check that the original asymptote $y = 3$ swaps to $x = 3$ in option E.

Answer is E

Difficulty: 84% of Students Answered this Question Correctly

QUESTION 3

Inverse functions are mirror images in the line $y = x$.

Answer is E

Difficulty: 71% of Students Answered this Question Correctly

QUESTION 4

Inverse functions are mirror images in the line $y = x$.

Answer is C