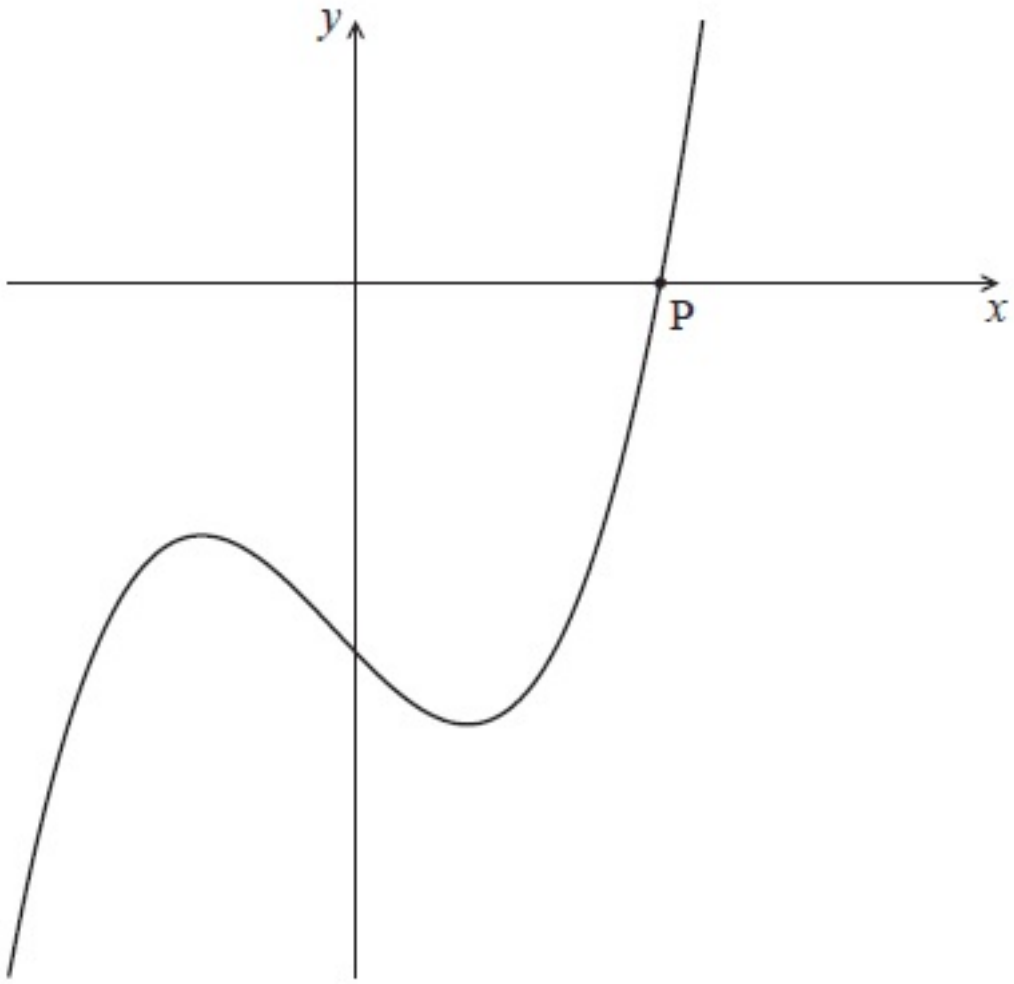
BECA / Huson / 11.1 IB Math SL Name:
26 September 2018

Homework: Function graphs, inverses

Hint: many of these problems can be solved using calculator graphing tools.

1a. Let $f(x) = x^3 - 2x - 4$. The following diagram shows part of the curve of f.



The curve crosses the x-axis at the point P.

Write down the x-coordinate of P. *[1 mark]*

2a. *[4 marks]*

Consider the function $f(x) = x^2 - 4x + 1$.

Sketch the graph of f, for $-1 \leq x \leq 5$.

2b. *[1 mark]*

This function can also be written as $f(x) = (x - p)^2 - 3$.

Write down the value of p.

2c. *[4 marks]*

The graph of g is obtained by reflecting the graph of f in the x-axis, followed by a translation of $\begin{pmatrix} 0 \\ 6 \end{pmatrix}$.

Show that $g(x) = -x^2 + 4x + 5$.

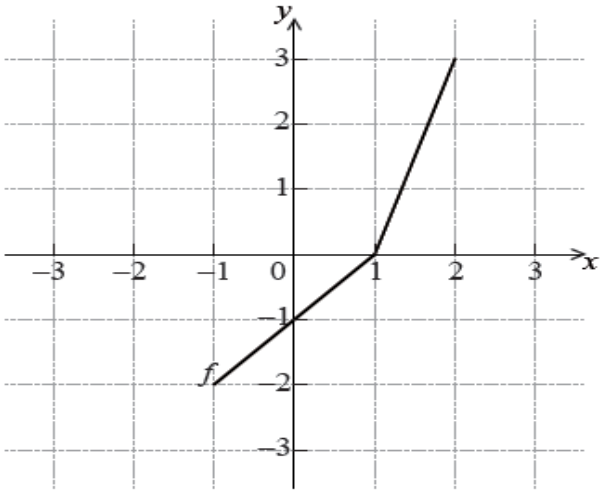
2d. *[3 marks]*

The graph of g is obtained by reflecting the graph of f in the x-axis, followed by a translation of $\begin{pmatrix} 0 \\ 6 \end{pmatrix}$.

The graphs of f and g intersect at two points.

Write down the x-coordinates of these two points.

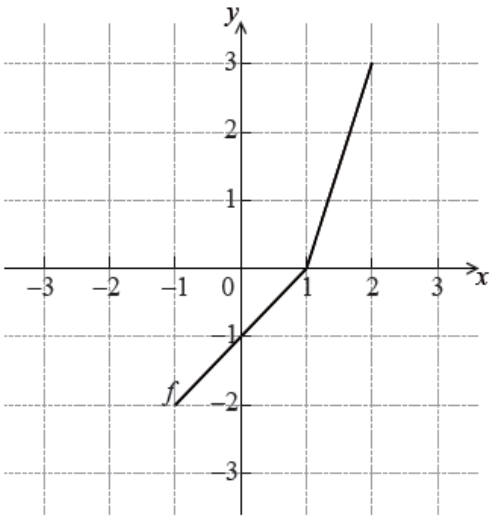
3a. The diagram below shows the graph of a function f, for $-1 \leq x \leq 2$.



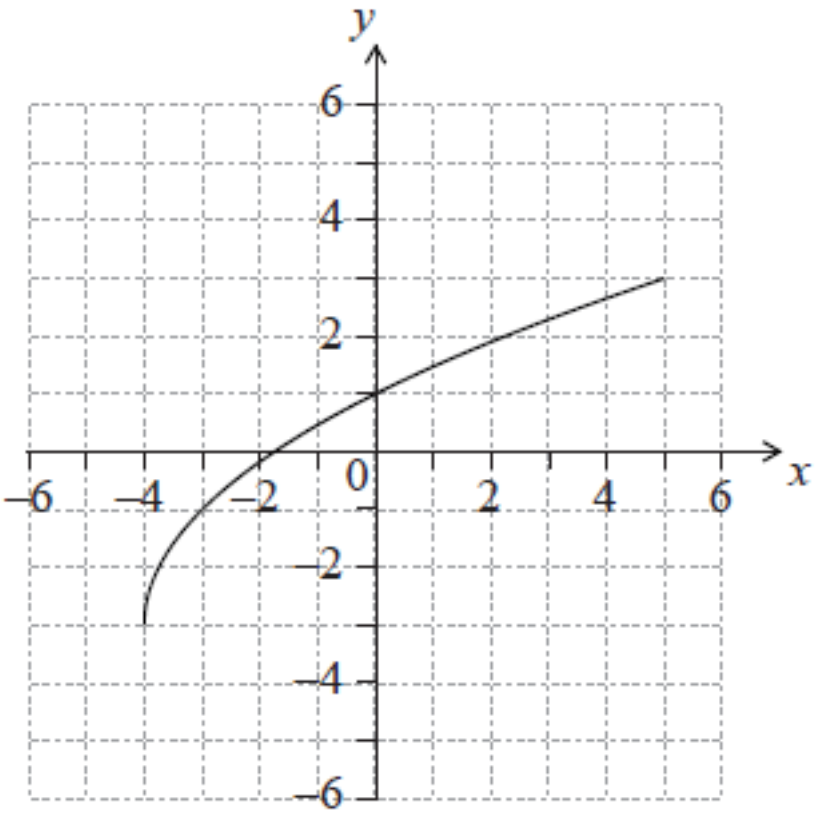
Write down the value of $f(2)$. *[1 mark]*

3b. Write down the value of $f^{-1}(-1)$. *[2 marks]*

3c. Sketch the graph of f^{-1} on the grid below. *[3 marks]*



5a. The following diagram shows the graph of $y = f(x)$, for $-4 \leq x \leq 5$.



Write down the value of $f(-3)$. *[1 mark]*

5b. Write down the value of $f^{-1}(1)$. *[1 mark]*

5c. *[2 marks]*

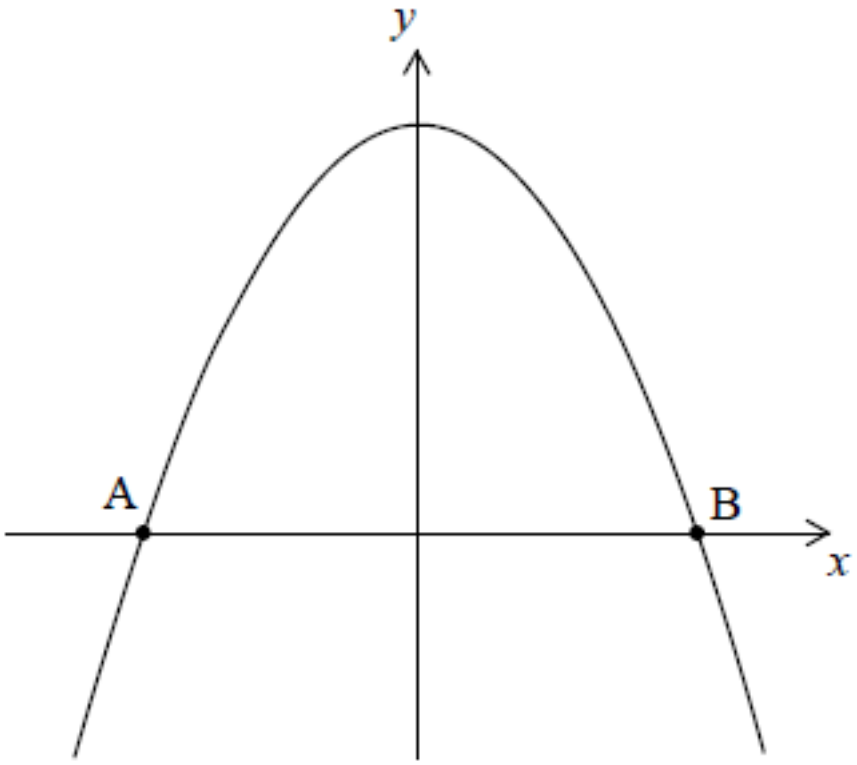
Find the domain of f^{-1}.

5d. *[3 marks]*

On the grid above, sketch the graph of f^{-1}.

6a. *[3 marks]*

Let $f(x) = 5 - x^2$. Part of the graph of f is shown in the following diagram.



The graph crosses the x-axis at the points A and B.

Find the x-coordinate of A and of B.