BECA / Huson / 11.1 IB Math SL   Name:

4 October 2018

Unit 1 Test: Function Operations

Answer on loose leaf paper in pen, or, for the graphs, on graph paper in pencil. Show working for all problems.

1. For the function $f(x) = 2x + 3$

   (a) What is the value of $f(-1)$?

   (b) Solve for x if $f(x) = 0$.

   (c) Find $f(3 - 2x)$.

   (d) Find the inverse of $f(x)$, $f^{-1}(x)$.

2. For the functions $f(x) = 1 - x^2$ and $g(x) = x - 4$

   (a) What is the value of $g(5)$?

   (b) Find $(f \circ g)(5)$.

   (c) Find $(f \circ g)(x)$.

3. Find the inverse of $f(x) = \dfrac{2x - 2}{3}$

4. For the functions defined by $f(x) = 2x$ and $g(x) = x + 4$

   (a) Find an expression for $(f \circ g)(x)$.

   (b) Find an expression for $(g \circ f)(x)$.

   (c) Solve $(f \circ g)(x) = (g \circ f)(x)$.

5. Write down the domain and range of $f(x) = x^2 - 6$

6. For the function shown in the graph below,

   (a) Write down the equations for the asymptotes.

   (b) Write down the domain and range of the function.

7. Using a GDC to analyze the function $f(x) = \dfrac{2x + 1}{x + 3}$

   (a) Write down the equations for the asymptotes.

   (b) Write down the domain and range of $f(x)$.

BECA / Huson / 11.1 IB Math SL   Name:
4 October 2018

8. Graph the function $f(x) = x^2 + 2x + 2$ over the domain $-1 \leq x \leq 1$.

   (a) Mark points on the function representing $f(-1) = 1$ and $f(1) = 5$. Label them as coordinate pairs.

   (b) Graph and label the inverse of f, $f^{-1}(x)$, on the same axes over the domain corresponding to the range of f graphed. Mark the inverses of the points named in part (a), labeling them as coordinate pairs.

   (c) Write down the domain and range of $f^{-1}(x)$ in the space below.