

SEKOLAH BUKIT SION – HIGH SCHOOL

AY 2020-2021

MATHEMATICS (EXTENDED) 0580

CHAPTER TEST

FUNCTIONS

NAME: _____ CLASS: _____ DATE: _____

INSTRUCTIONS:

1. Use any of the 3 methods to answer the questions in an orderly and neat manner.
 - using a file paper/a4
 - printed test paper
 - annotate the pdf file
2. Use **black** or **blue** pen.
Do not use highlighter or correction tape.
3. Once you are done, insert the **pdf printout** on the assigned page for this Chapter Test.
Do not “Add work” as it becomes a different file.
Your work should be found inside/within the Chapter Test page that was sent.
4. Keep a copy of your work in your personal channel and use
YourNameClass_CompositeInverseTest as the filename.
Example: Emman10.4_C1Test
5. Submit on-time. You only are given an extra 10 minutes after the specified time duration to scan and attach your files.

CLOSING TIME: 13:40 OR 1:40 PM.

After the closing time, your work will NO LONGER be accepted.

QUESTION 01

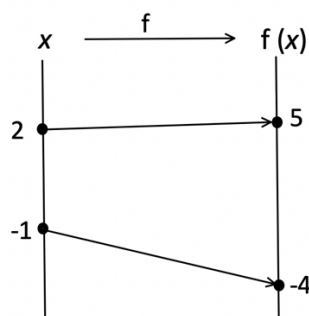
Given each composite function $fg(x)$, provide the missing $f(x)$ or $g(x)$.

[5]

	$f(g(x))$	$f(x)$	$g(x)$
(a)	$(3x - 4)^3$	x^3	
(b)	$\frac{1}{x^2 - 1}$		x^2
(c)	x	$-2x$	
(d)	$x^2 - 3x + 2$		$x - 1$
(e)	$\sqrt{x^3 - 1}$	\sqrt{x}	

QUESTION 02

The figure shows part of the mapping $f: x \rightarrow px + q$, $x \in \mathbb{R}$.



Find

- the value of p and q .
- the image of 3 under f .
- the element whose image is -2.

[3]

[1]

[1]

QUESTION 03

Given that $f(x) = (x - 2)^2 - 4$,

- (a) write down the coordinates of the vertex of the function. [2]
(b) (i) write down the domain of the function f for its inverse, $f^{-1}(x)$, to exist. [1]
(ii) hence, write down its inverse, $f^{-1}(x)$ expression.
Write down the domain and range of the $f^{-1}(x)$. [4]

QUESTION 04

The functions f and g are defined by:

$$f : x \rightarrow 3x + 2 \quad x \in \mathbb{R}$$

$$g : x \rightarrow \frac{6}{2x+3} \quad x \in \mathbb{R}, x \neq -1.5$$

- (a) Find the value of x for which $fg(x) = 3$. [3]
(b) Find an expression for $f^{-1}(x)$ and $g^{-1}(x)$.
Solve the equation $f^{-1}(x) = g^{-1}(x)$. [5]
(c) Sketch, in a single diagram, the graphs of $y = f(x)$ and $y = f^{-1}(x)$,
Making clear the relationship between the two graphs. [3]

QUESTION 05

A function f is defined by $f : x \rightarrow |2x - 5| - 2$, for $0 \leq x \leq 6$.

- (a) Sketch the graph of f . [3]
(b) State the range of f . [2]
(c) Solve algebraically $|2x - 5| - 2 = 2 - x$. [3]

QUESTION 06

Functions f and g are defined by:

$$f : x \rightarrow 4x - 3$$

$$g : x \rightarrow 2 - 3x^2$$

$$h : x \rightarrow \frac{1}{x}$$

- (a) Find in simplest expanded form:
(i) f^2 [2]
(ii) gh [2]
(ii) $fg(-1)$ [2]
(iii) gf [2]
(b) For what value of x is hf is undefined? [2]
(c) Which is TRUE, $(fg)^{-1}(x) = f^{-1}g^{-1}(x)$ **OR** $(fg)^{-1}(x) = g^{-1}f^{-1}(x)$?
Show the complete TRUE proof. [5]