



SEKOLAH BUKIT SION – HIGH SCHOOL

CHAPTER TEST: COMPOSITE AND INVERSE FUNCTIONS

NAME		DATE	
CLASS		SCORE	

ANSWER ALL QUESTIONS. PROVIDE NECESSARY WORKING.

1. Which pairs of the following functions are inverses of each other?

Write the **CAPITAL LETTERS** of the functions on the space provided.

A $y = x^2 - 2$

B $y = x - 7$

C $y = x^2 - 4x + 4$

D $y = \sqrt{x} + 2$

E $y = \sqrt{x - 2}$

F $y = x + 7$

G $y = \sqrt{x - 4 + \frac{x}{4}}$

H $y = 7 - x$

I $y = \sqrt{x + 2}$

Answer : and

..... and

..... and [3]

2. Let $f(x) = \sqrt{x}$ and $g(x) = x^2 + 2x + 1$, find $(f \circ g)(x)$, **in simplest form**.

Answer : [2]

3. Using $f(x) = 4 - x^2$ and $g(x) = \sqrt{x + 3}$ and $h(x) = \frac{2x-5}{3}$

(a) Evaluate:

(i) $fg(1)$

Answer : [1]

(ii) $gh(1)$ (correct to 2 decimal places)

Answer : [1]

(iii) $fg(x^2)$

Answer : [2]

(b) Express $f^{-1}g^{-1}(x)$ in simplest form.

Answer : [3]

(c) Explain why $fg(-4)$ does not exist.

Answer : [1]

4. Given that $f(x) = \sqrt{3x - 1}$ and $g(x) = x^2$, find an expression for

(a) $f^{-1}(x)$

Answer : [2]

(b) $(gf)^{-1}(x)$

Answer : [3]

5. Two functions are defined as $f(x) = 2x + 1$ and $g(x) = x^2 - 1$

(a) Express, in simplest forms, the functions:

(i) fg

Answer : [2]

(ii) gf

Answer : [2]

(iii) f^2

Answer : [2]

(iv) gf^{-1}

Answer : [3]

(b) Find the values of x for which $fg(x) = 7$.

Answer : [3]

(c) Find the values of x for which $gf(x) = g(x)$.

Answer : [3]

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

[6]

	$f(g(x))$	$f(x)$	$g(x)$
(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}	

7. Given that $f(x) = x + 3$ and $g(x) = x^2 - 2x + 1$.

Show that $\frac{gf(x) - g(x)}{3} = 2x + 1$.

[3]

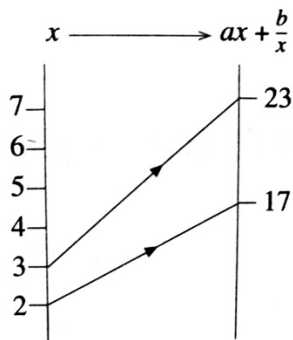
8. A function is defined by $g(x) = 3x - 1$.

By expressing your answer correct to 2 decimal places, solve for a in

$$g(a + 1) = g(2a^2 - 1).$$

Answer : [5]

9. The arrow diagram represents part of the mapping of $f(x) = ax + \frac{b}{x}$, where $x \neq 0$.



Find the value of a and b .

Answer : [5]

10. For the function by $f(x) = \frac{a}{x-1} + b$, where $x \neq 1$. Given that $f^{-1}(3) = 2$ and $f^{-1}(2) = 3$

(a) Find the value of a and b .

Answer : [5]

(b) Show that $ff(x) = x$.

[3]

*** END OF TEST ***