Differentiation & Functions (Q 6, 7 & 8, Paper 1)

Lesson No. 1: Working with Functions

2007

8 (a) Let $f(x) = \frac{1}{4}(6 - 2x)$ for $x \in \mathbf{R}$. Evaluate $f(5)$.

2006

8 (a) Let $g(x) = \dfrac{3}{x+1}$, $x \in \mathbf{R}$, $x \neq -1$.

Evaluate $g(0.5) - g(-0.5)$.

(b) Let $h(x) = x^2 + 2x - 1$, $x \in \mathbf{R}$.

(i) Simplify $h(x-5)$.

(ii) Find the value of x for which $h(x-5) = h(x) - 5$.

2005

6 (a) Let $g(x) = \dfrac{x+5}{2}$, $x \in \mathbf{R}$.

Find $g(0) + g(2)$.

2004

6 (a) Let $g(x) = 1 - kx$.

Given that $g(-3) = 13$, find the value of k.

8 (a) Let $g(x) = 3x - 7$.

(i) Find $g(7)$.

(ii) Find the value of k for which $g(7) = k[g(0)]$.

2003

6 (a) Let $g(x) = \dfrac{2x}{3} - 1$.

Find the value of x for which $g(x) = 5$.

8 (b) (i) The function g is defined for natural numbers by the rule:

0 if is even.

1 if is odd

Find $g(13) + g(14) + g(15)$.

(ii) Given that $h(x) = x^2$, write down $h(x + 3)$.

Hence, find the value of x for which $h(x) = h(x + 3)$.

2002

6 (a) Let $f(x) = \frac{1}{3}(x-8)$ for $x \in \mathbf{R}$.
Evaluate $f(5)$.

2001

6 (a) Let $g(x) = \dfrac{1}{x^2+1}$ for $x \in \mathbf{R}$.
Evaluate
(i) $g(2)$
(ii) $g(3)$ and write your answers as decimals.

2000

8 (a) Let $p(x) = 3x - 12$.
For what values of x is $p(x) < 0$ where x is a positive whole number?

1999

6 (a) Let $f(x) = 2(3x-1)$, $x \in \mathbf{R}$.
Find the value of x for which $f(x) = 0$.

1998

6 (a) If $f(x) = 5x - 8$ and $g(x) = 13 - 2x$, find the value of x for which
$f(x) = g(x)$.

1996

6 (a) Let $f(x) = 3x + k$, $x \in \mathbf{R}$.
If $f(5) = 0$, find the value of k.

ANSWERS

2007 8 (a) $f(5) = -1$

2006 8 (b) (i) $x^2 - 8x + 14$ (ii) $x = 2$

2005 6 (a) 6

2004 6 (a) 4

8 (a) (i) 14 (ii) -2

2003 6 (a) 9

8 (b) (i) 2 (ii) $x^2 + 6x + 9$; $-\frac{3}{2}$

2002 6 (a) -1

2001 6 (a) (i) 0.2 (ii) 0.1

2000 8 (a) {1, 2, 3}

1999 6 (a) $\frac{1}{3}$

1998 6 (a) 3

1996 6 (a) -15