ALGEBRA (Q 2 & 3, PAPER 1)

LESSON NO. 9: FUNCTIONS

2006

2 (b) Let $f(x) = 2x^3 + ax^2 + bx + 14$.

(i) Express $f(2)$ in terms of a and b.

(ii) If $f(2) = 0$ and $f(-1) = 0$, find the value of a and the value of b.

2004

3 (c) p is a positive number and f is the function $f(x) = (2x + p)(x - p)$, $x \in \mathbf{R}$.

(i) Given that $f(2) = 0$, find the value of p.

(ii) Hence, find the range of values of x for which $f(x) < 0$.

2002

3 (c) Let $f(x) = x^2 + ax + t$ where $a, t \in \mathbf{R}$.

(i) Find the value of a, given that $f(-5) = f(-1)$.

(ii) Given that there is only one value of x for which the $f(x) = 0$, find the value of t.

2001

3 (c) Let $f(x) = x^3 + ax^2 + bx - 6$ where a and b are real numbers.

Given that $x - 1$ and $x - 2$ are factors of $f(x)$

(i) find the value of a and the value of b

(ii) hence, find the values of x for which $f(x) = 0$.

2000

3 (c) (i) $f(x) = ax^2 + bx - 8$, where a and b are real numbers.

If $f(1) = -9$ and $f(-1) = 3$, find the value of a and the value of b.

(ii) Using your values of a and b from **(i)**, find the two values of x for which

$ax^2 + bx = bx^2 + ax$.

1997

3 (c) Let $f(x) = (2+x)(3-x),\ x \in \mathbf{R}$.

Write down the solutions (roots) of $f(x) = 0$.

Let $g(x) = 3x - k$.

The equation $f(x) + g(x) = 0$ has equal roots. Find the value of k.

1996

3 (c) Let $f(x) = (1-x)(2+x),\ x \in \mathbf{R}$.

Write down the solutions of $f(x) = 0$.

Find the range of values of x for which $f(x) > 0$.

Let $g(x) = f(x) - f(x+1)$.

Express $g(x)$ in the form $ax + b,\ a, b \in \mathbf{R}$.

Find the solution set of $g(x) < 0$.

ANSWERS

2006	2	(b) (i) $4a + 2b + 30$	(ii) $a = -9,\ b = 3$
2004	3	(c) (i) $p = 2$	(ii) $-1 < x < 2$
2002	3	(c) (i) $a = 6$	(ii) $t = 9$
2001	3	(c) (i) $a = -6,\ b = 11$	(ii) $x = 1, 2, 3$
2000	3	(c) (i) $a = 5,\ b = -6$	(ii) $x = 0, 1$
1997	3	(c) $x = -2, 3;\ k = 10$	
1996	3	(c) $x = -2, 1;\ -2 < x < 1;\ g(x) = 2x + 2;\ x < -1$	