KNOX GRAMMAR SCHOOL

R.J.B.D.

TERM 1 ASSESMENT TEST #2, 1994

MATHEMATICS

YEAR 11 3 UNIT

NAME:______________________

Questions to be answered on writing paper
In every question all necessary working needs to be shown.
All answers should be underlined.
Marks will be deducted for careless or badly arranged work.
*Each **part** should be started on a new page.*
This question paper is to be handed back with your solutions.

PART A

QUESTION 1 *(12 MARKS)*

For these functions; State the domain and range and sketch each:

(a) $f(x) = 3(x^2 - 1)$

(b) $g(x) = \dfrac{1}{x-4}$

(c) $h(x) = \sqrt{9 - x^2}$

(d) $F(x) = 3^{-x}$

QUESTION 2 *(8 MARKS)*

If $f(x) = 3x^2 + 2x - 12$, $g(x) = \dfrac{1}{x^2 - 1}$ and $h(x) = 2x$, find (in simplest form)

(a) $\dfrac{f(x) - f(c)}{x - c}$

(b) $f(x) \times g(x)$

(c) $f[h(x)] + h[f(x)]$

P.T.O.

PART B

QUESTION 3 *(7 MARKS)*

For the given points $A(0,2)$; $B(5,6)$; $C(3,-4)$ find,

(a) the equation of the line joining AB, in general form,

(b) the angle of inclination of line AB, (with the positive x-axis,to the nearest minute),

(c) the altitude CM from C to a point M on the line AB,

(d) the area of ΔABC.

QUESTION 4 *(8 MARKS)*

(a) Find the equation of the line through the point of intersection of the lines

$$L_1 : x - 2y \quad + 7 =$$
$$L_2 : 3x \quad + 4y$$

which is also parallel to the line $y = -2x \quad +$. Do not find the point of intersection of L_1 & L_2.

(b) The parallel lines $3x \quad + 4y \quad - 2 = 0$, and $3x \quad + 4y$ are 3 units apart. Show that the point $(0, \frac{1}{2})$ lies on the line $3x + 4y - 2 = 0$ and hence, find two possible values of "k".

QUESTION 5 *(5 MARKS)*

(a) Find the co-ordinates of the point which divides the interval joining (-7,7) and (-1,-2) externally in the ratio 2:1

(b) In what ratio does the point (2,-2) divide the interval joining (6,-8) and (-4,7)?

PART C

QUESTION 6 *(6 MARKS)*

Find the values of a and b for the polynomial $P(x) = 2x^3 + ax^2 + bx + 3$, if *(2x - 1)* is a factor, and when it is divided by *(x + 1)* a remainder of 12 exists.

QUESTION 7 *(4 MARKS)*

Divide $P(x) = 3x \quad ^4 + 7x \quad ^3$ by $A(x) = x^2 + 2$ and write the result in the form $P(x) = Q(x).\ A(x) + R(x$ where *Q(x)* and *R(x)* are the *quotient* and *remainder* respectively.

What changes to *P(x)* need to be made if *A(x)* is to be a factor of *P(x)*?

END OF TEST