November 3, 2009

Name: SOLUTIONS
Student ID: _____

Quiz 7

Question 1. *(6 marks)* Solve for x:

(a) $x^3 = 10x^2 + 39x$

$$x^3 - 10x^2 - 39x = 0$$
$$x(x^2 - 10x - 39) = 0$$
$$x(x - 13)(x + 3) = 0$$

$x = 0 \quad x - 13 = 0 \quad x + 3 = 0$
$\qquad\quad x = 13 \qquad x = -3$

$\therefore \ x = -3, 0, 13$

(b) $(4x - 1)(2x - 3) = -2$
$$8x^2 - 12x - 2x + 3 = -2$$
$$8x^2 - 14x + 3 + 2 = 0$$
$$8x^2 - 14x + 5 = 0$$
$$8x^2 - 4x - 10x + 5 = 0$$
$$4x(2x - 1) - 5(2x - 1) = 0$$

$A \cdot B = 40$
$A + B = -14$
$A = -10 \ B = -4$

$(4x - 5)(2x - 1) = 0$

$4x - 5 = 0 \qquad 2x - 1 = 0$
$4x = 5 \qquad\quad 2x = 1$
$x = \tfrac{5}{4} \qquad\quad x = \tfrac{1}{2}$

$\therefore \ x = \tfrac{1}{2}, \tfrac{5}{4}$

Question 2. *(4 marks)* Find 3 consecutive odd integers such that the product of the first and the third integer is 7 more than 10 times the middle one.

LET x BE THE FIRST ODD INTEGER
THEN $x + 2$ IS THE SECOND ODD INTEGER
$x + 4$ IS THE THIRD ODD INTEGER

$$x(x + 4) = 10(x + 2) + 7$$
$$x^2 + 4x = 10x + 20 + 7$$
$$x^2 + 4x = 10x + 27$$
$$x^2 - 6x - 27 = 0$$
$$(x + 3)(x - 9) = 0$$

$x + 3 = 0 \qquad x - 9 = 0$
$x = -3 \qquad\quad x = 9$

$\therefore$ THE INTEGERS ARE
$-3, -1, 1$
OR
$9, 11, 13$