Full Name : ..... **Date: .....**

Short Assessment 2

Time Allowed: 15 minutes **Total Marks: 15**

1. Find the discriminant of the following quadratic expressions:

(a) $2x^2 + 3x - 6$

$\Delta = b^2 - 4ac$

$= 3^2 - 4(2)(-6)$

$= \underline{\underline{57}}$

(b) $3x^2 - 5x + 2$

$\Delta = b^2 - 4ac$

$= (-5)^2 - 4(3)(2)$

$= \underline{\underline{1}}$

(2 marks)

2. Use the discriminant to determine the number of real roots of each of the following quadratic equations:

(a) $x^2 + 5x - 2 = 0$

$\Delta = b^2 - 4ac$

$= 5^2 - 4(1)(-2) = 33 > 0$

Since $\Delta > 0$, there are two distinct real roots.

(b) $2x^2 - 3x + 6 = 0$

$\Delta = (-3)^2 - 4(2)(6)$

$= -39 < 0$

Since $\Delta < 0$, there are no real roots to this equation.

(4 marks)

3. (a) Find the discriminant of $2x^2 - 5x + k$ in terms of k.

$\Delta = b^2 - 4ac$

$= (-5)^2 - 4(2)k$

$= 25 - 8k$

(2 marks)

(b) Given that the quadratic equation $2x^2 - 5x + k = 0$ has two distinct real roots, find the set of possible values of k.

Since the equation has two distinct real roots,

$\Delta > 0$

$25 - 8k > 0$

$25 > 8k$

$\frac{25}{8} > k$

$\therefore k < \frac{25}{8}$

(3 marks)

4. The quadratic equation $px^2 + 7x + p = 0$ has repeated real roots.

Find the possible values of the constant p.

Since this has repeated real roots,

$b^2 - 4ac = 0$

$7^2 - 4(p)(p) = 0$

$49 = 4p^2$

$p^2 = \frac{49}{4}$

$p = \pm \frac{7}{2}$ //

(4 marks)

- End of Test -