Quadratic Formula Handout/Worksheet

1. **The Quadratic Formula**: For a quadratic equation of the form $ax^2 + bx + c = 0$ ($a \neq 0$) the solutions are
$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

2. **Solve the following equation using the quadratic formula**

   (a) $y(y + 4) = -12$

3. **Procedure for using the discriminant to determine the number and type of solutions to a quadratic equatuion:** Consider the equation $ax^2 + bx + c = 0$, where a, b and c are rational numbers and $a \neq 0$. The expression $b^2 - 4ac$ is called the ***discriminant***. Furthermore,

   (a) If $b^2 - 4ac > 0$, then there will be two real solutions.

   (b) If $b^2 - 4ac$ is a perfect square, the solutions will be rational numbers.

   (c) If $b^2 - 4ac$ is a not a perfect square, the solutions will be irrational numbers.

   (d) If $b^2 - 4ac < 0$, then there will be two imaginary solutions.

   (e) If $b^2 - 4ac = 0$, then there will be one rational solution.

4. **Use the discriminant to determine the type and number of solutions for the equation.**

   (a) $3y^2 + y + 3 = 0$

(b) $3t(t+1) = 9$

(c) $4t^2 = 6t - 2$

(d) $\frac{2}{3}x^2 - \frac{2}{3}x + \frac{1}{6} = 0$

5. **Solve the following equations using *any* method**

(a) $2t(t-1) + t^2 = 5$

(b) $x^2 - 4x = -7$