Recall the *standard form* of a quadratic equation: $ax^{2}+bx+c=0$, where $a,b, $ and $c$ are real numbers and $a\ne 0$.

Derive the quadratic formula by completing the square. It may be EC on the Exam.

***Quadratic Formula***

If $ax^{2}+bx+c=0$ with $a\ne 0$ then $x=\frac{-b\pm \sqrt{b^{2}-4ac}}{2a}$

\*No point in using it if memorized incorrectly.

Ex 1 Solve using the quadratic equation.

$$x=6\pm 2\sqrt{3}$$

1. $x^{2}-12x=-24$

$$x=-2\pm i\sqrt{11}$$

1. $x^{2}+4x+15=0$

$$x=\frac{3\pm \sqrt{21}}{3}=1\pm \frac{\sqrt{21}}{3}$$

1. $3x^{2}-6x=4$

Ex: If $f\left(x\right)=2x^{2}+7x-9$ find the values of x such that $f\left(x\right)=0$

$$x=1,-\frac{9}{2}$$

Ex: If $g\left(t\right)=\frac{1}{4}+\frac{6}{t+2} \& f\left(t\right)=\frac{6}{t}$ Find all values of t such that $f\left(t\right)=g(t)$

Multiply both sides of the equation by the LCD $4(\left(t\right)\left(t+2\right))$

$$\frac{1}{4}+\frac{6}{t+2}=\frac{6}{t} $$

$$4\left(\left(t\right)\left(t+2\right)\right)\left[\frac{1}{4}+\frac{6}{t+2}\right]=\left[\frac{6}{t}\right]4(\left(t\right)\left(t+2\right))$$

$$\rightarrow 1\left[t\left(t+2\right)\right]+6\left[4\left(t\right)\right]=6\left[4\left(t+2\right)\right]$$

$$\rightarrow t^{2}+2t+24t=24t+48$$

$$\rightarrow t^{2}+2t-48=0$$

$$\rightarrow \left(t+8\right)\left(t-6\right)=0$$

$$\rightarrow t=6,-8$$