**Solving Quadratics by Completing the Square GREEN**

**Question 1**

a) Express $x^{2}+6x-4$ in the form $(x-a)^{2}+b$, where $a$ and $b$ are integers.

b) Hence state the minimum point of the graph of $y=x^{2}+6x-4$.

c) Solve $x^{2}+6x-4=0$, giving your answer exactly.

**Question 2**

a) Express $x^{2}-4x+2$ in the form $(x-a)^{2}+b$, where $a$ and $b$ are integers.

b) Hence state the minimum point of the graph of $y=x^{2}-4x+2$.

c) Solve $x^{2}-4x+2=0$, giving your answer exactly.

**Question 3**

a) Express $x^{2}+5x+1$ in the form $(x-a)^{2}+b$, where $a$ and $b$ are integers.

b) Hence state the minimum point of the graph of $y=x^{2}+5x+1$.

c) Solve $x^{2}+5x+1=0$, giving your answer exactly.

**Question 4**

a) Express $3x^{2}+6x-2$ in the form $a(x-b)^{2}+c$, where $a$, $b$ and $c$ are integers.

b) Hence state the minimum point of the graph of $y=3x^{2}+6x-2$.

c) Solve $3x^{2}+6x-2=0$, giving your answer exactly.

**Solving Quadratics by Completing the Square AMBER**

**Question 1**

a) Express $x^{2}+6x-4$ in the form $(x-a)^{2}+b$, where $a$ and $b$ are integers.

Half the coefficient of $x$ to find $a$.

Subtract $a^{2}$ to find $b$.

b) Hence state the minimum point of the graph of $y=x^{2}+6x-4$.

The graph $y=(x-a)^{2}+b$ has a minimum point at $\left(a, b\right)$.

c) Solve $x^{2}+6x-4=0$, giving your answer exactly.

Use your answer for part (a) and write it equal to $0$.

**Question 2**

a) Express $x^{2}-4x+2$ in the form $(x-a)^{2}+b$, where $a$ and $b$ are integers.

b) Hence state the minimum point of the graph of $y=x^{2}-4x+2$.

c) Solve $x^{2}-4x+2=0$, giving your answer exactly.

**Question 3**

a) Express $x^{2}+5x+1$ in the form $(x-a)^{2}+b$, where $a$ and $b$ are integers.

b) Hence state the minimum point of the graph of $y=x^{2}+5x+1$.

c) Solve $x^{2}+5x+1=0$, giving your answer exactly.

**Question 4**

a) Express $3x^{2}+6x-2$ in the form $a(x-b)^{2}+c$, where $a$, $b$ and $c$ are integers.

Factorise out the coefficient of $x^{2}$ from the first two terms to find $a$.

Half the new coefficient of $x$ to find $b$.

Subtract $b^{2}$ to find $c$.

b) Hence state the minimum point of the graph of $y=3x^{2}+6x-2$.

The graph $y=a(x-b)^{2}+c$ has a minimum point at $\left(b, c\right)$.

c) Solve $3x^{2}+6x-2=0$, giving your answer exactly.

**Solving Quadratics by Completing the Square RED**

**Question 1**

a) Express $x^{2}+6x-4$ in the form $(x-a)^{2}+b$, where $a$ and $b$ are integers.

Half the coefficient of $x$ to find $a$.

Subtract $a^{2}$ to find $b$.

 $(x+3)^{2}-4-9$

b) Hence state the minimum point of the graph of $y=x^{2}+6x-4$.

The graph $y=(x-a)^{2}+b$ has a minimum point at $\left(a, b\right)$.

c) Solve $x^{2}+6x-4=0$, giving your answer exactly.

Use your answer for part (a) and write it equal to $0$.

 $\left(x+3\right)^{2}\\_\\_\\_\\_\\_\\_\\_=0$

**Question 2**

a) Express $x^{2}-4x+2$ in the form $(x-a)^{2}+b$, where $a$ and $b$ are integers.

 $(x\\_\\_\\_\\_\\_\\_\\_\\_\\_)^{2}+2-\\_\\_\\_\\_\\_\\_\\_$

b) Hence state the minimum point of the graph of $y=x^{2}-4x+2$.

c) Solve $x^{2}-4x+2=0$, giving your answer exactly.

**Question 3**

a) Express $x^{2}+5x+1$ in the form $(x-a)^{2}+b$, where $a$ and $b$ are integers.

 $(x\\_\\_\\_\\_\\_\\_\\_\\_\\_)^{2}+1-\\_\\_\\_\\_\\_\\_\\_$

b) Hence state the minimum point of the graph of $y=x^{2}+5x+1$.

c) Solve $x^{2}+5x+1=0$, giving your answer exactly.

**Question 4**

a) Express $3x^{2}+6x-2$ in the form $a(x-b)^{2}+c$, where $a$, $b$ and $c$ are integers.

Factorise out the coefficient of $x^{2}$ from the first two terms to find $a$.

Half the new coefficient of $x$ to find $b$.

Subtract $ab^{2}$ to find $c$.

 $3\left(x^{2}+3x\right)-2$

 $3(x\\_\\_\\_\\_\\_\\_\\_\\_\\_)^{2}-2-(3×\\_\\_\\_\\_\\_\\_\\_)$

b) Hence state the minimum point of the graph of $y=3x^{2}+6x-2$.

The graph $y=a(x-b)^{2}+c$ has a minimum point at $\left(b, c\right)$.

c) Solve $3x^{2}+6x-2=0$, giving your answer exactly.