Outcome 3 – Using the Quadratic Formula

Bronze example

Examples…
Given on formula sheet!
$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Solve $x^2 + 6x + 4 = 0$ giving your solutions to 1 decimal place…

$a = 1 \qquad b = 6 \qquad c = 4$

$$\frac{-6 \pm \sqrt{36 - 4(4)}}{2 \times 1} = \frac{-6 \pm \sqrt{20}}{2}$$

$$= \frac{-6 - \sqrt{20}}{2} \quad \text{and} \quad \frac{-6 + \sqrt{20}}{2}$$

$x = -5 \cdot 2 \quad \text{and} \quad x = -0 \cdot 8$

Silver example

Examples…
Given on formula sheet!
$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Solve $x^2 - 8x + 3 = 0$ giving your solutions to 1 decimal place…

$a = 1 \qquad b = -8 \qquad c = 3$

$$\frac{8 \pm \sqrt{64 - 4(3)}}{2 \times 1} = \frac{8 \pm \sqrt{52}}{2}$$

$$= \frac{8 - \sqrt{52}}{2} \quad \text{and} \quad \frac{8 + \sqrt{52}}{2}$$

$x = 0 \cdot 4 \quad \text{and} \quad x = 7 \cdot 6$

Gold example

Examples…
Given on formula sheet!
$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Solve $x^2 - 8x - 2 = 0$ giving your solutions to 1 decimal place…

$a = 1 \qquad b = -8 \qquad c = -2$

$$\frac{8 \pm \sqrt{64 - 4(-2)}}{2 \times 1} = \frac{8 \pm \sqrt{72}}{2}$$

$$= \frac{8 - \sqrt{72}}{2} \quad \text{and} \quad \frac{8 + \sqrt{72}}{2}$$

$x = -0 \cdot 2 \quad \text{and} \quad x = 8 \cdot 2$

Bronze Questions

Solve the following quadratic equations rounding your solutions to 1 decimal place…

1. $x^2 + 10x + 4 = 0$ 2. $x^2 + 6x + 1 = 0$

3. $x^2 + 9x + 1 = 0$ 4. $x^2 + 7x + 5 = 0$

5. $2x^2 + 6x + 3 = 0$ 6. $3x^2 + 9x + 2 = 0$

7. $x^2 + 11x + 3 = 0$ 8. $2x^2 + 10x + 3 = 0$

9. $x^2 + 8x + 3 = 0$ 10. $x^2 + 5x + 2 = 0$

Silver Questions

Solve the following quadratic equations rounding your solutions to 1 decimal place…

1. $x^2 - 7x + 3 = 0$ 2. $x^2 - 9x + 1 = 0$

3. $x^2 - 4x + 1 = 0$ 4. $x^2 - 8x + 1 = 0$

5. $2x^2 - 8x + 4 = 0$ 6. $3x^2 - 5x + 1 = 0$

7. $x^2 - 12x + 3 = 0$ 8. $2x^2 - 7x + 2 = 0$

9. $x^2 - 5x + 2 = 0$ 10. $x^2 - 3x + 1 = 0$

Gold Questions

Solve the following quadratic equations rounding your solutions to 1 decimal place…

1. $x^2 - 10x - 2 = 0$ 2. $x^2 + 5x - 1 = 0$

3. $x^2 + 9x - 1 = 0$ 4. $x^2 - 8x - 4 = 0$

5. $2x^2 - 4x - 3 = 0$ 6. $3x^2 - 7x - 2 = 0$

7. $x^2 - 11x - 4 = 0$ 8. $2x^2 + 6x - 3 = 0$

9. $x^2 - 5x - 2 = 0$ 10. $x^2 + 10x - 9 = 0$

Bronze Answers

1. $x = -9\cdot6$ and $x = -0\cdot4$ 2. $x = -5\cdot8$ and $x = -0\cdot2$
3. $x = -8\cdot9$ and $x = -0\cdot1$ 4. $x = -6\cdot2$ and $x = -0\cdot8$
5. $x = -2\cdot4$ and $x = -0\cdot6$ 6. $x = -2\cdot8$ and $x = -0\cdot2$
7. $x = -10\cdot7$ and $x = -0\cdot3$ 8. $x = -4\cdot7$ and $x = -0\cdot3$
9. $x = -7\cdot6$ and $x = -0\cdot4$ 10. $x = -4\cdot6$ and $x = -0\cdot4$

Silver Answers

1. $x = 0\cdot5$ and $x = 6\cdot5$ 2. $x = 0\cdot1$ and $x = 8\cdot9$
3. $x = 0\cdot3$ and $x = 3\cdot7$ 4. $x = 0\cdot1$ and $x = 7\cdot9$
5. $x = 0\cdot6$ and $x = 3\cdot4$ 6. $x = 0\cdot2$ and $x = 1\cdot4$
7. $x = 0\cdot3$ and $x = 11\cdot7$ 8. $x = 0\cdot3$ and $x = 3\cdot2$
9. $x = 0\cdot4$ and $x = 4\cdot6$ 10. $x = 0\cdot4$ and $x = 2\cdot6$

Gold Answers

1. $x = -0\cdot2$ and $x = 10\cdot2$ 2. $x = -5\cdot2$ and $x = 0\cdot2$
3. $x = -9\cdot1$ and $x = 0\cdot1$ 4. $x = -0\cdot5$ and $x = 8\cdot5$
5. $x = -0\cdot6$ and $x = 2\cdot6$ 6. $x = -0\cdot3$ and $x = 2\cdot6$
7. $x = -0\cdot4$ and $x = 11\cdot4$ 8. $x = -3\cdot2$ and $x = 0\cdot2$
9. $x = -0\cdot4$ and $x = 5\cdot4$ 10. $x = -10\cdot8$ and $x = 0\cdot8$