Outcome 1 – Completing the Square

Bronze examples…

Examples…

Write the following quadratics in the form…

$y = (x + a)^2 + b.$

$y = x^2 + 8x + 4$

$= (x+4)^2 + 4 - 16$ ** half the coefficient of x!**

$= (x+4)^2 - 12$ ** square it and take it away!**

$y = x^2 - 2x - 10$

$= (x-1)^2 - 10 - 1$

$= (x-1)^2 - 11$

Silver example

Examples…

Write the following quadratics in the form…

$y = (x + a)^2 + b.$

$y = x^2 + 7x + 3$ ** half the coefficient of x!**

$= (x + \frac{7}{2})^2 + 3 - \frac{49}{4}$ ** square it and take it away!**

$= \left(x + \frac{7}{2}\right)^2 - \frac{37}{4}$

Gold example

Examples…

Write the following quadratics in form…

$y = a(x + b)^2 + c.$

$y = 2x^2 + 12x + 7$ ** common factor first!**

$= 2(x^2 + 6x) + 7$ ** Then complete the square as normal**

$= 2(x+3)^2 + 7 - 18$ ** Don't forget to multiply!**

$= 2(x+4)^2 - 11$

Bronze Questions

Write the following quadratics in the form…

$y = (x + a)^2 + b.$

1. $y = x^2 + 8x + 5$
2. $y = x^2 + 10x + 10$
3. $y = x^2 + 2x - 7$
4. $y = x^2 + 4x + 3$
5. $y = x^2 + 6x - 2$
6. $y = x^2 - 12x + 15$
7. $y = x^2 - 2x + 14$
8. $y = x^2 - 8x + 1$
9. $y = x^2 - 6x - 9$
10. $y = x^2 - 14x + 40$

Silver Questions

Write the following quadratics in the form…

$y = (x + a)^2 + b.$

1. $y = x^2 + 5x + 7$
2. $y = x^2 + 13x + 22$
3. $y = x^2 + x - 10$
4. $y = x^2 + 7x + 26$
5. $y = x^2 + 3x - 6$
6. $y = x^2 - 11x + 17$
7. $y = x^2 - x + 29$
8. $y = x^2 - 3x + 5$
9. $y = x^2 - 9x - 15$
10. $y = x^2 - 17x + 38$

Gold Questions

Write the following quadratics in the form…

$y = a(x + b)^2 + c.$

1. $y = 3x^2 + 12x + 2$
2. $y = 2x^2 + 16x + 3$
3. $y = 4x^2 + 16x - 7$
4. $y = 3x^2 + 24x - 11$
5. $y = 2x^2 + 28x - 5$
6. $y = 3x^2 - 36x + 8$
7. $y = 9x^2 - 18x + 19$
8. $y = 2x^2 - 4x + 25$
9. $y = 8x^2 - 32x - 7$
10. $y = 2x^2 - 14x + 5$

Bronze Answers

1. $y = (x + 4)^2 - 11$
2. $y = (x + 5)^2 - 15$
3. $y = (x + 1)^2 - 8$
4. $y = (x + 2)^2 - 1$
5. $y = (x + 3)^2 - 11$
6. $y = (x - 6)^2 - 21$
7. $y = (x - 1)^2 + 13$
8. $y = (x - 4)^2 - 15$
9. $y = (x - 3)^2 - 18$
10. $y = (x - 7)^2 - 9$

Silver Answers

1. $y = (x + 5/2)^2 + 3/4$
2. $y = (x + 13/2)^2 - 81/4$
3. $y = (x + 1/2)^2 - 41/4$
4. $y = (x + 7/2)^2 + 55/4$
5. $y = (x + 3/2)^2 - 33/4$
6. $y = (x - 11/2)^2 - 53/4$
7. $y = (x - 1/2)^2 + 115/4$
8. $y = (x - 3/2)^2 + 11/4$
9. $y = (x - 9/2)^2 - 141/4$
10. $y = (x - 17/2)^2 - 137/4$

Gold Answers

1. $y = 3(x + 2)^2 - 10$
2. $y = 2(x + 4)^2 - 29$
3. $y = 4(x + 2)^2 - 23$
4. $y = 3(x + 4)^2 - 59$
5. $y = 2(x + 7)^2 - 103$
6. $y = 3(x - 6)^2 - 100$
7. $y = 9(x - 1)^2 + 10$
8. $y = 2(x - 1)^2 + 23$
9. $y = 8(x - 2)^2 - 39$
10. $y = 2(x - 7/2)^2 + 3/2$