**Completing the Square RED**

1) Halve the coefficient of x.

2) Put in brackets with the x and square the brackets.

3) Subtract the half-coefficient squared.

4) Don’t forget the constant on the end!

5) Simply.

1) (a) Complete the square for x² **+** **8**x – 9.

 (x **+ 4**)² - (**4**)² - 9

 (x + 4)² - 16 - 9

 (x + 4)² - 25

Solve your answer from part (a). Don’t forget the positive AND negative square root.

 (b) Hence solve x² + 8x – 9 = 0

 (x + 4)² - 25 = 0

 (x + 4)² = 25

 x + 4 = ±√25 x = -4 ±√25 = 1 or -9

 (c) Identify the minimum point of y = x² + 8x – 9

Use your answer from part (a). Remember for

(x - p)2 + q = 0

the minimum is (p, q).

 (x + 4)² - 25

 Minimum = (-4, -25)

2) (a) Complete the square for x² **- 6**x – 10.

 (x **- 3**)² - (**-3**)² - 10

 (b) Hence solve x² - 6x – 10 = 0

 (c) Identify the minimum point of y = x² - 6x – 10.

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3) (a) Complete the square for x² **+ 10**x – 9.

 (b) Hence solve x² + 10x – 9 = 0

 (c) Identify the minimum point of y = x² + 10x – 9.

4) (a) Complete the square for x² **+** **6**x – 7.

 (b) Hence solve x² + 6x – 7 = 0

 (c) Identify the minimum point of y = x² + 6x – 7.

5) (a) Complete the square for x² **- 10**x + 3.

1) Halve the coefficient of x.

2) Put in brackets with the x and square the brackets.

3) Subtract the half-coefficient squared.

4) Don’t forget the constant on the end!

5) Simply.

 (b) Hence solve x² - 10x + 3 = 0

Solve your answer from part (a). Don’t forget the positive AND negative square root.

Use your answer from part (a). Remember for

(x - p)2 + q = 0

the minimum is (p, q).

 (c) Identify the minimum point of y = x² - 10x + 3.

6) (a) Complete the square for x² **- 7**x + 1.

 (b) Hence solve x² - 7x + 1 = 0

 (c) Identify the minimum point of y = x² - 7x + 1.

7) (a) Complete the square for x² **+ 12**x – 5.

 (b) Hence solve x² + 12x – 5 = 12

Be careful with the +12 on the RHS!

 (c) Identify the minimum point of y = x² + 12x – 5.

8) (a) Complete the square for x² **+ 3**x + 4.

 (b) Hence solve x² + 3x + 4 = 9

Be careful with the +9 on the RHS!

 (c) Identify the minimum point of y = x² + 3x + 4.

**Completing the Square AMBER**

1) Halve the coefficient of x.

2) Put in brackets with the x and square the brackets.

3) Subtract the half-coefficient squared.

4) Don’t forget the constant on the end!

5) Simply.

1) (a) Complete the square for x² **+** **8**x – 9.

Solve your answer from part (a). Don’t forget the positive AND negative square root.

 (b) Hence solve x² + 8x – 9 = 0

Use your answer from part (a). Remember for

(x - p)2 + q = 0

the minimum is (p, q).

 (c) Identify the minimum point of y = x² + 8x – 9

2) (a) Complete the square for x² **- 6**x – 10.

 (b) Hence solve x² - 6x – 10 = 0

 (c) Identify the minimum point of y = x² - 6x – 10.

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3) (a) Complete the square for x² **+ 10**x – 9.

 (b) Hence solve x² + 10x – 9 = 0

 (c) Identify the minimum point of y = x² + 10x – 9.

4) (a) Complete the square for x² **+** **6**x – 7.

 (b) Hence solve x² + 6x – 7 = 0

 (c) Identify the minimum point of y = x² + 6x – 7.

5) (a) Complete the square for x² **- 10**x + 3.

 (b) Hence solve x² - 10x + 3 = 0

 (c) Identify the minimum point of y = x² - 10x + 3.

6) (a) Complete the square for x² **- 7**x + 1.

 (b) Hence solve x² - 7x + 1 = 0

 (c) Identify the minimum point of y = x² - 7x + 1.

7) (a) Complete the square for x² **+ 12**x – 5.

 (b) Hence solve x² + 12x – 5 = 12

 (c) Identify the minimum point of y = x² + 12x – 5.

8) (a) Complete the square for x² **+ 3**x + 4.

 (b) Hence solve x² + 3x + 4 = 9

 (c) Identify the minimum point of y = x² + 3x + 4.

**Completing the Square GREEN**

5) (a) Complete the square for x² - 10x + 3.

 (b) Hence solve x² - 10x + 3 = 0

 (c) Identify the minimum point of y = x² - 10x + 3.

6) (a) Complete the square for x² - 7x + 1.

 (b) Hence solve x² - 7x + 1 = 0

 (c) Identify the minimum point of y = x² - 7x + 1.

7) (a) Complete the square for x² + 12x – 5.

 (b) Hence solve x² + 12x – 5 = 12

 (c) Identify the minimum point of y = x² + 12x – 5.

8) (a) Complete the square for x² + 3x + 4.

 (b) Hence solve x² + 3x + 4 = 9

 (c) Identify the minimum point of y = x² + 3x + 4.

9) (a) Complete the square for 4x² + 8x - 12.

 (b) Hence solve 4x² + 8x – 12 = 0

 (c) Identify the minimum point of y = 4x² + 8x - 12.

10) (a) Complete the square for 3x² + 6x - 9.

 (b) Hence solve 3x² + 6x - 9 = 0

 (c) Identify the minimum point of y = 3x² + 6x - 9.

11) (a) Complete the square for 5x² + 10x – 16.

 (b) Hence solve 5x² + 10x – 16 = 8

 (c) Identify the minimum point of y = 5x² + 10x – 16.

12) (a) Complete the square for 2x² + 6x + 5.

 (b) Hence solve 2x² + 6x + 5 = 12

 (c) Identify the minimum point of y = 2x² + 6x + 5.