Completing the square **Worksheet 1** Name_____

Factor the quadratic expressions Below **(C Grade GCSE)**
(The ≡ sign means 'identity'. It holds true for all values)

$x^2 + 5x \equiv x(\quad)$

$x^2 - 3x$

$2x^2 + 12x$

Factor the quadratic expressions below **(B Grade GCSE)**

$x^2 + 3x - 10 \equiv (\quad)(\quad)$

$x^2 + x - 12$

$x^2 + 8x + 12$

Write the following expressions as perfect squares **(B grade GCSE)**

$x^2 + 10x + 25 \equiv (\quad)^2$

$x^2 - 4x + 4$

$x^2 - 20x + 100$

Complete the square for the following expressions
(B/A Grade GCSE)

$x^2 + 8x + 20 \equiv (\quad)^2 +$

$x^2 - 10x + 15$

$x^2 + 5x - 10$

$x^2 + 8x + 20$

$x^2 + 3x + 10$

$x^2 + 20x + 99$

$x^2 - 2x + 1.5$

$x^2 + 40x + 399$

Solve the quadratic equations using the method of completing the square **(A Grade GCSE)**

$x^2 - 10x + 15 = 0$
(use your answer in the previous section to help)

$x^2 + 4x - 21 = 0$

$x^2 - 4x - 12 = 0$
(Check these ones by factoring the equation too)

$x^2 - 4x - 9 = 0$

$x^2 - 5x - 2.75 = 0$
(Write down why this one is harder!)

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Completing the square **Worksheet A** Name_____

Write the following expressions as perfect squares **(B grade GCSE)**

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x^2-4x+4

$x^2-20x+100$

Complete the square for the following expressions: **(B/A Grade GCSE)**

$x^2+8x+20 \equiv (\quad)^2+$

$x^2-10x+15$

$x^2+5x-10$

$x^2+8x+20$

$x^2+3x+10$

Express the following in completed square form in terms of p and q

x^2+px+q

Solve the quadratic equations using the method of completing the square: **(A Grade GCSE)**

$x^2-10x+15=0$

(use your answer in the previous section to help)

$x^2-4x-12=0$

(Check this one by factoring the equation too)

$x^2-9x-4=10$

(Could this one have been solved a different way? If so state how)

Explain why this equation cannot be solved by first completing the square **(A/A* GCSE grade):**

$x^2+8x+20=0$

The solutions to the quadratic equation $ax^2+bx+c=0$ can be found by using the quadratic equation or formula

$$x=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$$

Show this by completing the square on $ax^2+bx+c=0$

To complete the square the coefficient on the term in x^2 has to be 1. By factoring the following expression, show that the $2x^2+3x+8$ can be written in the form $p(x+q)^2+r$ where p, q and r are to be found.

Completing the square **Worksheet A** Name_____

Write the following expressions as perfect squares **(B grade GCSE)**

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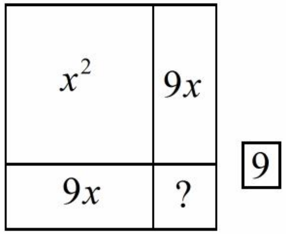
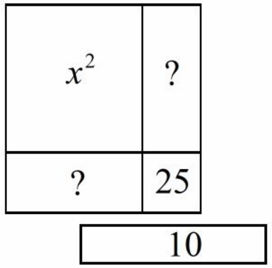
Extension tasks

Find an expression for each of the following in the form $ax^2 + bx + c$





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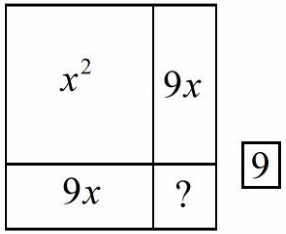

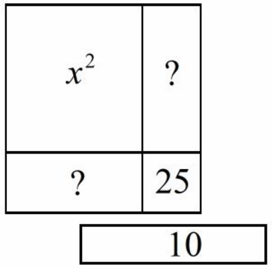

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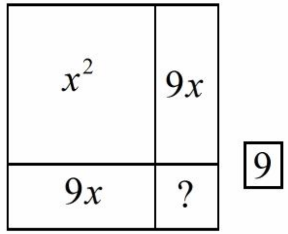

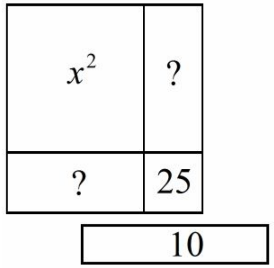

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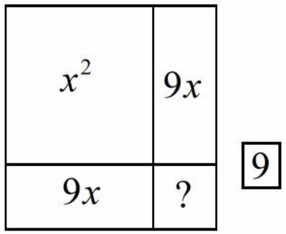

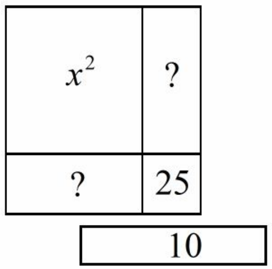

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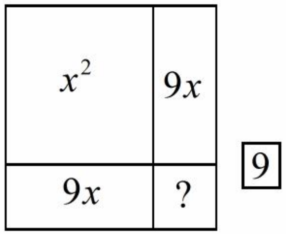

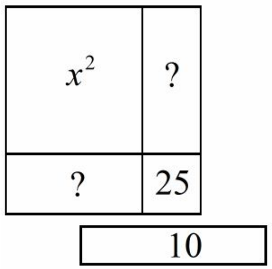

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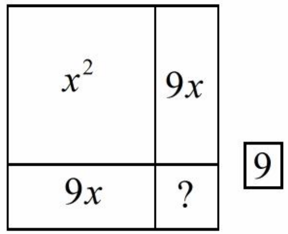

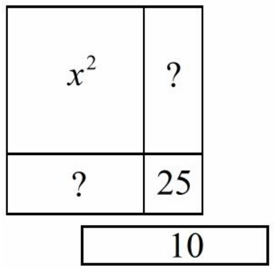

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