The Panda Math Tutor

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Completing the Square

Student Worksheet

Questions & Working Space

IGCSE Mathematics

Name: _____

Date: _____

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Note

How to use this worksheet. These questions are built *strictly* on the *Completing the Square* notes: the perfect square identities, completing the square when the coefficient of x^2 is 1, completing the square when it is not 1 (including negative leading coefficients), reading the vertex and the minimum or maximum value from the completed form, solving quadratic equations by completing the square, deciding how many real roots an equation has, and the derivation of the quadratic formula.
Working space. Ruled lines follow each question. Show every step — in particular, write down the number you are subtracting rather than doing it in your head, since that is where marks are won and lost.
Always check by expanding. Every completed square answer in this worksheet can be checked in ten seconds by expanding it back out. Do it every time: it catches almost every sign error.
Checking your answers. Full step-by-step solutions, a marking scheme for the exam paper, and a quick answer key are in the separate booklet *"Completing the Square — Solutions & Answer Key."* Try each question honestly before you look.

1 Part I — Topic-by-Topic Exercises

1.1 Perfect Square Identities

Exercise PS1 *[Basic]*

Expand $(x + 9)^2$.

Exercise PS2 *[Basic]*

Expand $(x - 4)^2$.

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Exercise PS3 *[Standard]*

Expand $\left(x+\frac{5}{2}\right)^2$, leaving your answer in fractions.

Exercise PS4 *[Standard]*

Find the constant that must be placed in each gap to make a perfect square trinomial.

(a) $x^2+16x+_____$

(b) $x^2-22x+_____$

(c) $x^2+7x+_____$

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Exercise PS5 *[Intermediate]*

Find the values of p and q such that $x^2-14x+q\equiv(x+p)^2$.

Hint

Compare the coefficient of x on both sides: expanding $(x+p)^2$ gives a middle term of $2px$.

Preview ends here

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