

National 5 Maths Completing the Square

SQA past paper and specimen paper
questions and answers by topic

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National 5 Maths
SQA 2014 Paper 1
Question 3

Express $x^2 - 14x + 44$ in the form $(x - a)^2 + b$.

2

Answer:

$$(x - 7)^2 - 5$$

National 5 Maths
SQA 2016 Paper 2
Question 9

Express $x^2 + 8x - 7$ in the form $(x + a)^2 + b$.

2

Answer:

$$(x + 4)^2 - 23$$

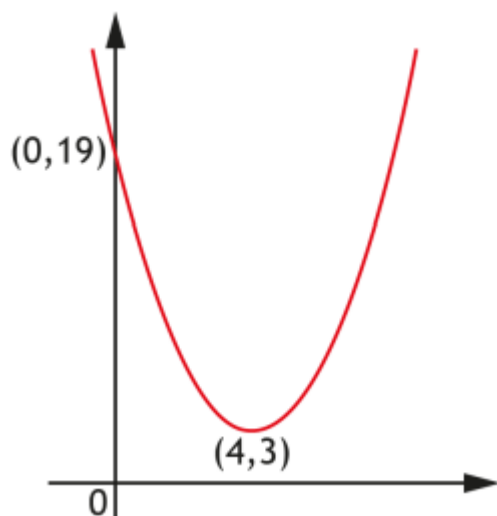
A parabola has equation $y = x^2 - 8x + 19$.

- (a) Write the equation in the form $y = (x - p)^2 + q$. 2
- (b) Sketch the graph of $y = x^2 - 8x + 19$, showing the coordinates of the turning point and the point of intersection with the y -axis. 3

Answers:

(a) $y = (x - 4)^2 + 3$

(b)



National 5 Maths
SQA 2018 Paper 1
Question 19

National 5 Maths

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- (a) (i) Express $x^2 - 6x - 81$ in the form $(x - p)^2 + q$. 2
- (ii) Hence state the equation of the axis of symmetry of the graph of $y = x^2 - 6x - 81$. 1
- (b) The roots of the equation $x^2 - 6x - 81 = 0$ can be expressed in the form $x = d \pm d\sqrt{e}$.
Find, algebraically, the values of d and e . 4
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Answer:

- (a) (i) $(x - 3)^2 - 90$
(ii) $x = 3$
- (b) $d = 3, e = 10$

National 5 Maths
SQA 2019 Paper 2
Question 10

Express $x^2 + 10x - 15$ in the form $(x + p)^2 + q$.

2

Answer:

$$(x + 5)^2 - 40$$

(a) Express $x^2 + 8x + 15$ in the form $(x + a)^2 + b$. 2

(b) Hence, or otherwise, state the coordinates of the turning point of the graph of $f(x) = x^2 + 8x + 15$. 1

Answers:

(a) $(x + 4)^2 - 1$

(b) $(-4, -1)$

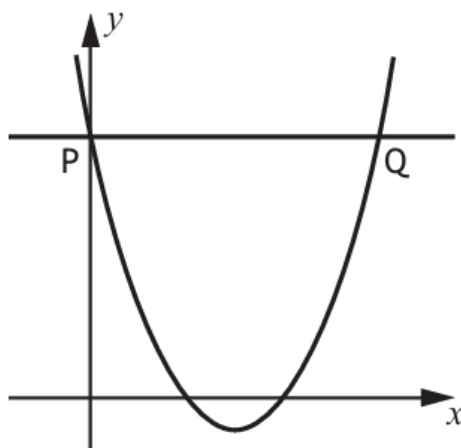
(a) Express $x^2 - 6x + 8$ in the form $(x - a)^2 + b$. 2

(b) Hence, or otherwise, state the coordinates of the turning point of the graph of $y = x^2 - 6x + 8$. 1

The diagram shows the graph of $y = x^2 - 6x + 8$.

A line PQ has been drawn parallel to the x -axis, where:

- P lies on the y -axis
- P and Q lie on the graph of $y = x^2 - 6x + 8$.



(c) Find the coordinates of Q. 2

Answers:

(a) $(x - 3)^2 - 1$

(b) $(3, -1)$

(c) $(6, 8)$

National 5 Maths
SQA 2025 Paper 2
Question 5

Express $x^2 + 10x + 19$ in the form $(x + a)^2 + b$.

2

Answer:

$$(x + 5)^2 - 6$$