

National 5 Mathematics

Graphs of Quadratic Functions - Solutions - 2014-2019

Marks are indicated in brackets after each question number

2014 Paper 1 Question 3, (2)

$$x^2 - 14x + 44 = (x - 7)^2 - 5$$

2014 Paper 1 Question 7, (2)

$$y = ax^2$$

Substituting $(-3, 45)$ gives

$$45 = a(-3)^2$$

$$= 9a$$

$$a = 5$$

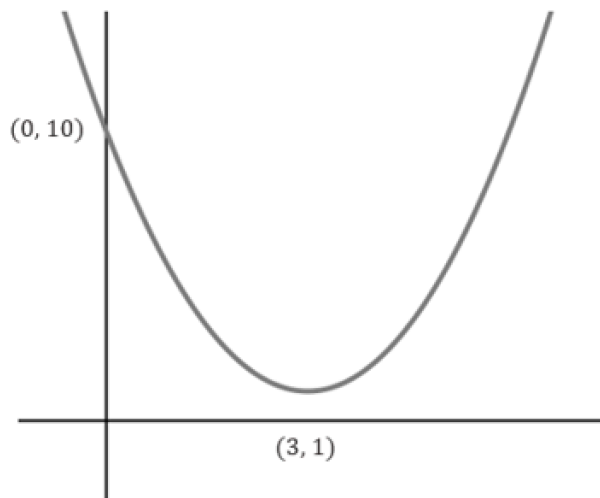
2015 Paper 1 Question 7, (1) (1) (1)

a) i) $a = -2$

ii) $b = -4$

b) $x = -4$

2016 Paper 1 Question 10, (3)



2016 Paper 2 Question 9, (2)

$$x^2 + 8x - 7 = (x + 4)^2 - 23$$

2017 Paper 1 Question 14, (1) (2)

a) $a = 5$

b) $y = (x + 5)^2 + b$

Substituting the point $(-3, 8)$ gives

$$8 = (-3 + 5)^2 + b$$

$$8 = 4 + b$$

$$b = 4$$

2018 Paper 1 Question 16, (3)

$$y = (x - 6)(x + 4)$$

For roots, let $y = 0$ to give

$$0 = (x - 6)(x + 4)$$

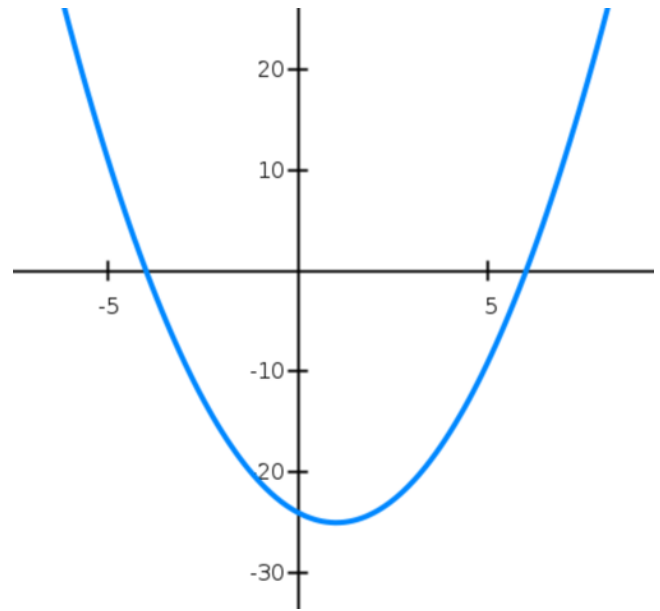
$$x = -4, x = 6$$

For y-intercept, let $x = 0$ to give

$$y = (0 - 6)(0 + 4)$$

$$= (-6)(4)$$

$$= -24$$



2018 Paper 1 Question 19, (2) (1)

$$\begin{aligned} \text{a) i) } x^2 - 6x - 81 &= (x - 3)^2 - 9 - 81 \\ &= (x - 3)^2 - 90 \end{aligned}$$

$$\text{ii) } x = 3$$

2019 Paper 1 Question 9, (1) (1) (1)

$$\text{a) } x = 4$$

$$\text{b) i) } a = -4$$

$$\text{ii) } b = 20$$

2019 Paper 2 Question 10, (2)

$$x^2 + 10x - 15 = (x + 5)^2 - 40$$