National 5 Mathematics

Quadratic Equations - **Questions** - 2014-2019

Marks are indicated in brackets after each question number

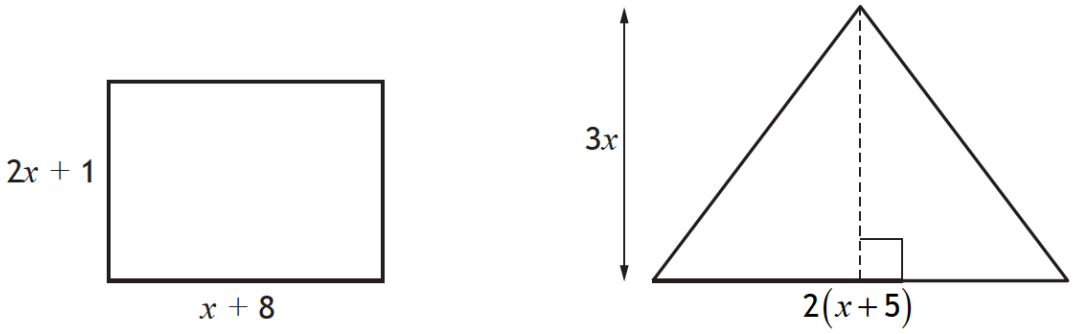
2016 Paper 1 Question 6, (2)

Determine the nature of the roots of the function $f(x) = 7x^2 + 5x - 1$.

2016 Paper 1 Question 12, (1) (3) (3)

The diagrams below show a rectangle and a triangle.

All measurements are in centimetres.



(a) Find an expression for the area of the **rectangle**.

(b) Given that the area of the rectangle is equal to the area of the triangle, show that $x^2 - 2x - 8 = 0$.

(c) Hence find, **algebraically**, the length and breadth of the rectangle.

2017 Paper 2 Question 4, (3)

Solve the equation $2x^2 + 5x - 4 = 0$.

Give your answers correct to one decimal place.

2018 Paper 1 Question 5, (2)

Solve

$$x^2 - 11x + 24 = 0.$$

2018 Paper 1 Question 8, (2)

Determine the nature of the roots of the function $f(x) = 2x^2 + 4x + 5$.

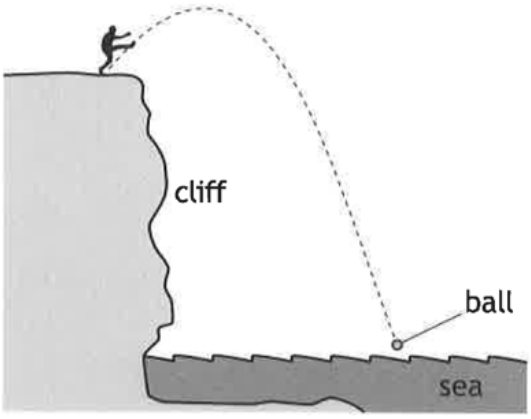
2018 Paper 1 Question 19, (2) (1) (4)

(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.

2019 Paper 1 Question 15, (1) (4)

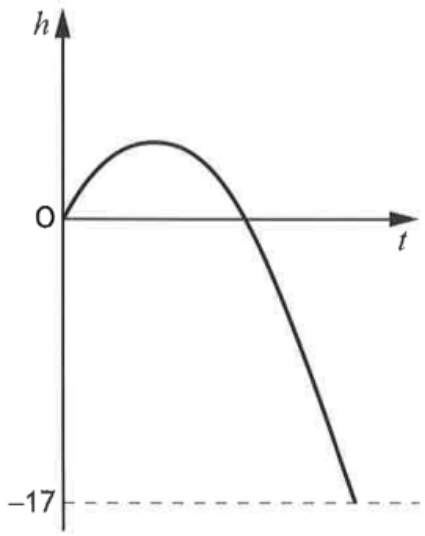
A ball is kicked from a clifftop.



The height, h metres, of the ball relative to the clifftop after t seconds is given by $h = 12t - 5t^2$.

(a) Calculate the height of the ball above the clifftop after 2 seconds.

The graph below represents the height, h metres, of the ball relative to the clifftop after t seconds.



The sea is 17 metres below the clifftop.

(b) After how many seconds will the ball hit the sea?

2019 Paper 2 Question 6, (3)

Solve the equation $3x^2 + 9x - 2 = 0$.

Give your answers correct to 1 decimal place.