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National 5 Maths Quadratic Formula

SQA past paper and specimen paper questions and answers by topic

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National 5 Maths
SQA 2015 Paper 2
Question 14

National 5 Maths
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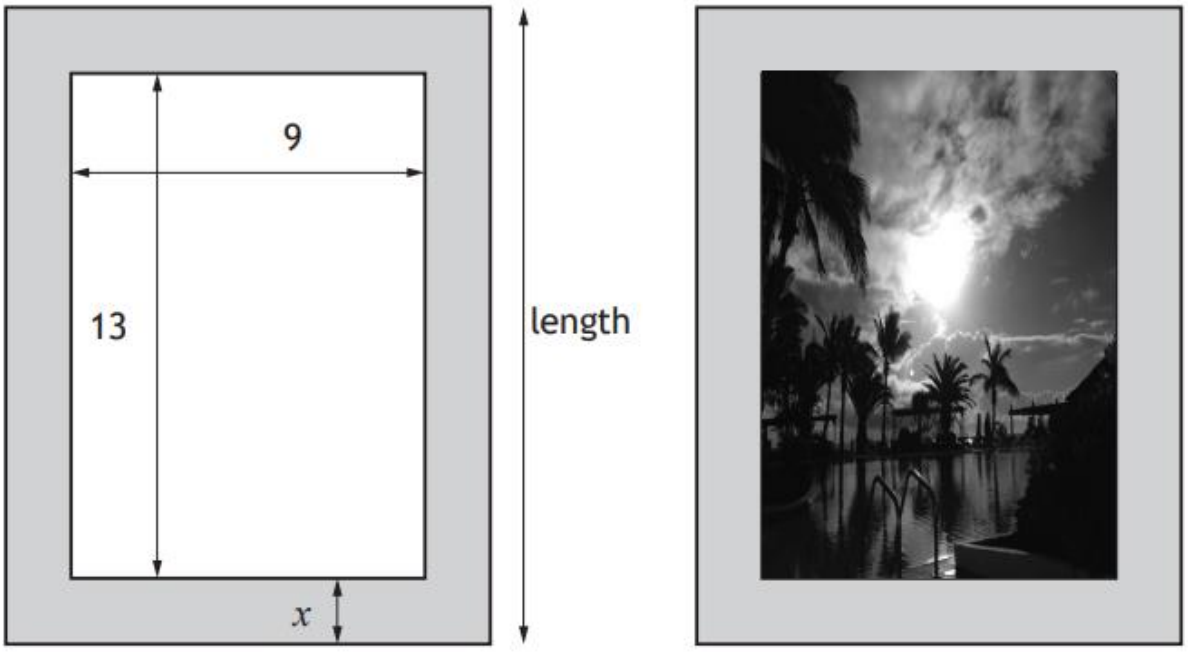
A rectangular picture measuring 9 centimetres by 13 centimetres is placed on a rectangular piece of card.

The area of the card is 270 square centimetres.

There is a border x centimetres wide on all sides of the picture.



(a) (i) Write down an expression for the length of the card in terms of x. **1**

(ii) Hence show that $4x^2 + 44x - 153 = 0$. **2**

(b) Calculate x, the width of the border.

Give your answer correct to one decimal place. **4**

Answers:

(a) (i) $2x + 13$

(ii) Use "area = length × width" to obtain the required equation.

(b) 2.8 cm

National 5 Maths
SQA 2017 Paper 2
Question 4

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

Give your answers correct to one decimal place. **3**

Answer:

$x = -3.1$ or $x = 0.6$

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**

Answer:

(a) (i) $(x-3)^2-90$

(ii) $x=3$

(b) $d=3, e=10$

National 5 Maths
SQA 2019 Paper 2
Question 6

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

Give your answers correct to 1 decimal place. **3**

Answer:

$x = -3.2$ or $x = 0.2$

National 5 Maths
SQA 2021 Paper 2
Question 15

National 5 Maths
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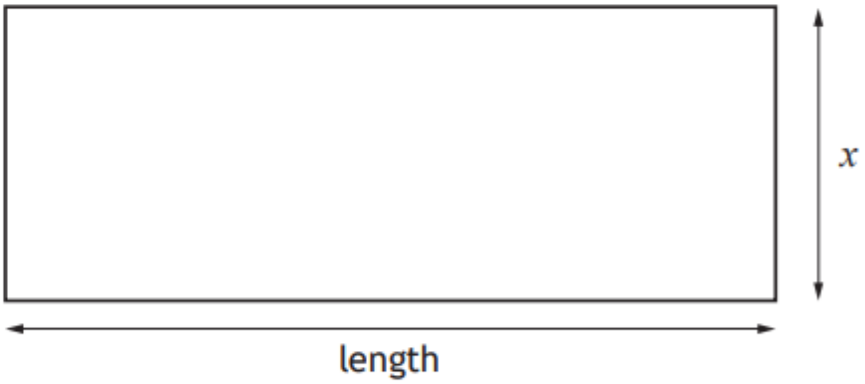
The diagram shows a rectangle with breadth x centimetres.



The length of the rectangle is 5 centimetres more than its breadth.

(a) Write down an expression for its length in terms of x. **1**

The rectangle has an area of 20 square centimetres.

(b) Show that $x^2 + 5x - 20 = 0$. **2**

(c) Calculate x, the breadth of the rectangle.
Give your answer correct to one decimal place. **4**

Answers:

(a) $x+5$

(b) Equate to area and rearrange into required form

(c) 2.6 cm

National 5 Maths
SQA 2022 Paper 2
Question 7

Solve the equation $4x^2 + 2x - 7 = 0$.

Give your answers correct to 2 significant figures. **4**

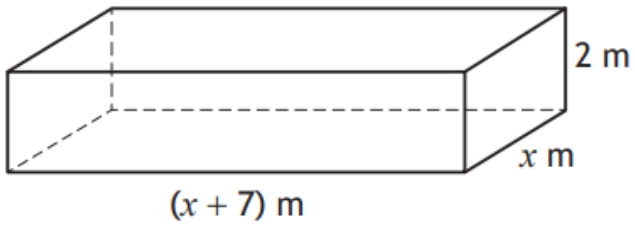
Answer:

$x = -1.6$ or $x = 1.1$

National 5 Maths
SQA 2023 Paper 2
Question 14

National 5 Maths
Maths.scot

A storage unit, built in the shape of a cuboid, is shown.



It has length $(x+7)$ metres, breadth x metres and height 2 metres.

The volume of this unit is 45 cubic metres.

(a) Show that $2x^2 + 14x - 45 = 0$. **2**

(b) Calculate x, the breadth of the storage unit.
Give your answer correct to 1 decimal place. **4**

Answers:

(a) Use the dimensions of the cuboid to find an expression for the volume. Then rearrange it into the required form.

(b) $x = 2.4$

National 5 Maths
SQA 2024 Paper 2
Question 8

Solve the equation $3x^2 + 8x + 1 = 0$.

Give your answers correct to 2 decimal places. 3

Answer:

$x = -0.13$ or $x = -2.54$