Maths.scot

National 5 Maths
Factorising

SQA past paper and specimen paper questions and answers by topic

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National 5 Maths
SQA 2013 Specimen
Paper 1 Question 4

National 5 Maths
Maths.scot

Solve the equation

$$2x^2 + 7x - 15 = 0.$$

3

Answer:

$x = -5$ or $x = \frac{3}{2}$

National 5 Maths
SQA 2014 Paper 1
Question 13

National 5 Maths
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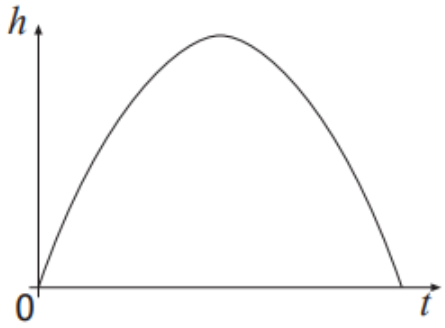
The diagram below shows the path of a small rocket which is fired into the air. The height, h metres, of the rocket after t seconds is given by

$$h(t) = 16t - t^2$$



(a) After how many seconds will the rocket first be at a height of 60 metres? **4**

(b) Will the rocket reach a height of 70 metres?
Justify your answer. **3**

Answers:

(a) 6 seconds

(b) No, because its maximum height is 64 metres.

National 5 Maths
SQA 2015 Paper 1
Question 12

National 5 Maths
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Simplify $\frac{x^2-4x}{x^2+x-20}$. **3**

Answer:

$\frac{x}{x+5}$

National 5 Maths
SQA 2016 Paper 1
Question 12

National 5 Maths
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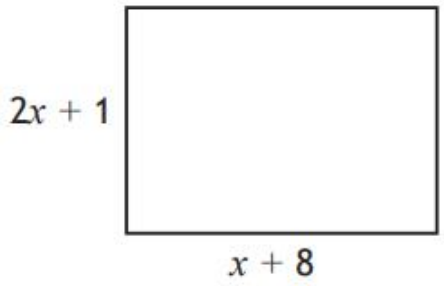
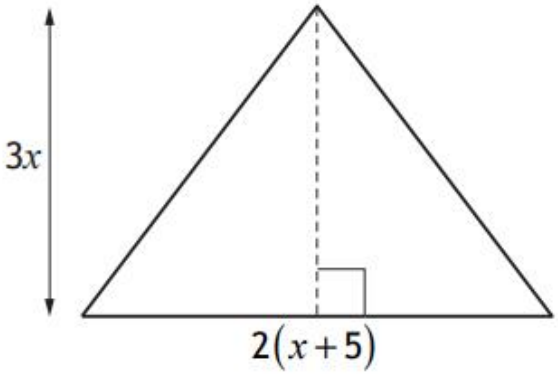
The diagrams below show a rectangle and a triangle.

All measurements are in centimetres.





(a) Find an expression for the area of the **rectangle**. **1**

(b) Given that the area of the rectangle is equal to the area of the triangle, show that $x^2 - 2x - 8 = 0$. **3**

(c) Hence find, **algebraically**, the length and breadth of the rectangle. **3**

Answers:

(a) $(2x + 1)(x + 8)$ or equivalent

(b) Expand area of rectangle, equate to area of triangle and rearrange into required form.

(c) 12 cm and 9 cm

National 5 Maths
SQA 2016 Paper 2
Question 4

Factorise fully $3x^2 - 48$. **2**

Answer:

$3(x+4)(x-4)$

National 5 Maths
SQA 2017 Paper 2
Question 9

National 5 Maths
Maths.scot

(a) Factorise $4x^2 - 25$. 1

(b) Hence simplify $\frac{4x^2 - 25}{2x^2 - x - 10}$. 3

Answers:

(a) $(2x-5)(2x+5)$

(b) $\frac{2x+5}{x+2}$

National 5 Maths
SQA 2018 Paper 1
Question 5

Solve

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

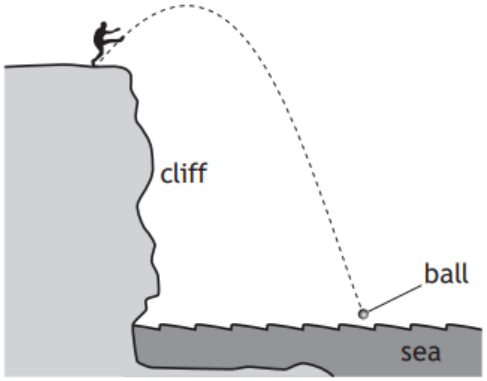
Answer:

$x = 3$ or $x = 8$

National 5 Maths
SQA 2019 Paper 1
Question 15

National 5 Maths
Maths.scot

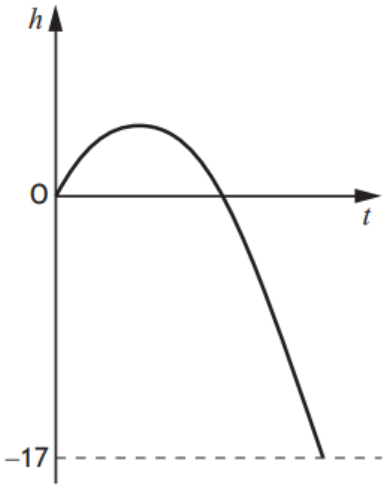
A ball is kicked from a clifftop.



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. **1**

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? **4**

Answers:

(a) 4 metres

(b) 3.4 seconds

National 5 Maths
SQA 2019 Paper 2
Question 13

National 5 Maths
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Find an expression for the gradient of the line joining point A(6,9) to point B($4p$,$4p^2$).

Give your answer in its simplest form. 3

Answer:

$$\frac{2p+3}{2}$$

National 5 Maths
SQA 2021 Paper 1
Question 19

National 5 Maths
Maths.scot

Solve the equation **by factorising**

$$6x^2 + 13x - 5 = 0$$ 3

Answer:

$x = -\frac{5}{2}$ or $x = \frac{1}{3}$

National 5 Maths
SQA 2021 Paper 2
Question 3

National 5 Maths
Maths.scot

Factorise fully $3a^2 - 75$. **2**

Answer:

$3(a-5)(a+5)$

National 5 Maths
SQA 2022 Paper 2
Question 12

National 5 Maths
Maths.scot

Simplify $\frac{2ab+6a}{b^2-9}$. 3

Answer:

$\frac{2a}{b-3}$

National 5 Maths
SQA 2023 Paper 2
Question 12

National 5 Maths
Maths.scot

Simplify $\frac{x^2-16}{x^2+x-20}$. 3

Answer:

$\frac{x+4}{x+5}$