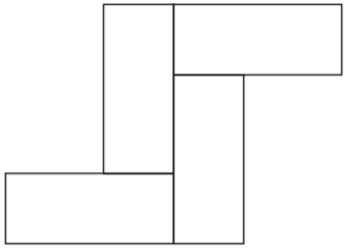
Four Maths Questions at Different Levels – Question Set 10

Easy higher tier GCSE

The length of the rectangle is 7 cm longer than the width of the rectangle.

4 of these rectangles are used to make this 8-sided shape.

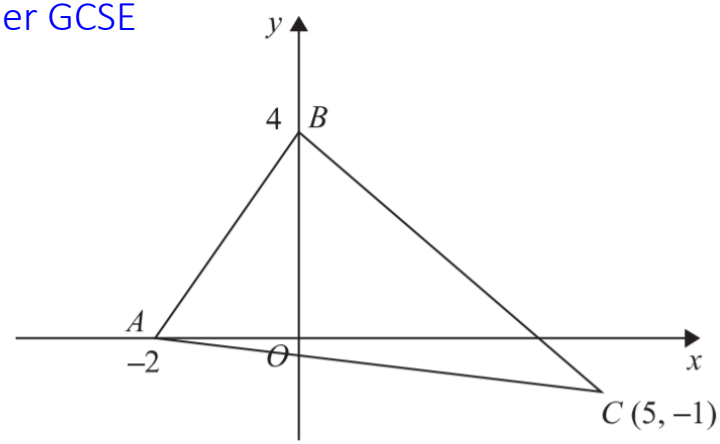


The perimeter of the 8-sided shape is 70 cm.

Work out the area of the 8-sided shape.

Edexcel GCSE, Nov 2017, Paper 3

Harder higher tier GCSE



Find an equation of the line that passes through C and is perpendicular to AB.

Edexcel GCSE, Specimen 1, Paper 1

Something interesting

Take any prime number greater than 3, square it and subtract 1.
Is the answer a multiple of 24?

Try again, and again, and again.

Why is that?

(@mathstechnology)

A Level

The variable Y has the distribution $N(\mu, \frac{\mu^2}{9})$. Find $P(Y > 1.5\mu)$.

OCR, Paper 2, June 2018

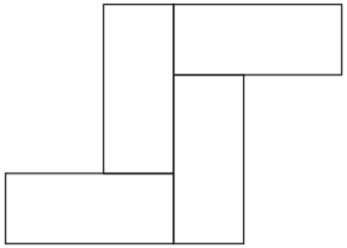
Answers at www.colmanweb/easter2020

Four Maths Questions at Different Levels – Answers Set 10

Easy higher tier GCSE

The length of a rectangle is 7 cm longer than the width of the rectangle.

4 of these rectangles are used to make this 8-sided shape.



The perimeter of the 8-sided shape is 70 cm.

Work out the area of the 8-sided shape. $147\ cm^2$

Edexcel GCSE, Nov 2017, Paper 3

Harder higher tier GCSE

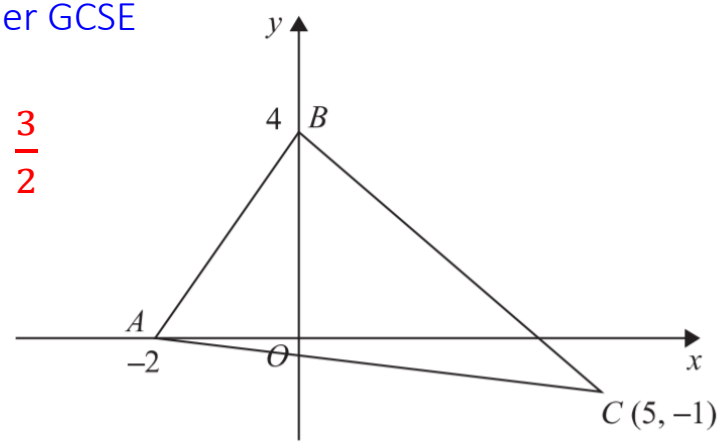
$$y = -\frac{1}{2}x + \frac{3}{2}$$

or

$2y = -x + 3$

or

$2y + x - 3 = 0$



Find an equation of the line that passes through C and is perpendicular to AB.

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Take any prime number greater than 3, square it and subtract 1.

Is the answer a multiple of 24?

Try again, and again, and again.

Why is that?

p^2-1 = (p+1)(p-1) ⇒ p-1, p+1 are three consecutive integers.
Since p is a prime >3, then either p-1 or p+1 is a multiple of three.
Furthermore, both p-1 and p+1 are also multiples of two
and either p-1 or p+1 is a multiple of four.
∴ p^2–1 is a multiple of 2 × 3 × 4 = 24.
A nice proof of this is also possible in base 12.

(@mathstechnology)

A Level

The variable Y has the distribution $N(\mu, \frac{\mu^2}{9})$. Find $P(Y > 1.5\mu)$.

0.0668 or 0.067

OCR, Paper 2, June 2018