

## Four Maths Questions at Different Levels – Question Set 12

Easy higher tier GCSE

On a farm

the number of cows and the number of sheep are in the ratio 6 : 5  
the number of sheep and the number of pigs are in the ratio 2 : 1

The total number of cows, sheep and pigs on the farm is 189

How many sheep are there on the farm?

Edexcel GCSE, Specimen Papers 2

Harder higher tier GCSE

Show that  $\frac{1}{1 + \frac{1}{\sqrt{2}}}$  can be written as  $2 - \sqrt{2}$

Edexcel GCSE, Sample papers 1

Something interesting

Four people on a trek, come upon a rope bridge that must be crossed to reach home.

The bridge only holds two people. It's dark and they have just one torch so their only option is to lead each other across, back and forth, until they are all across.

The first person claims they can cross the bridge in 1 minute, the next person in 2 minutes, the next in 5 minutes and the last in 10 minutes. As each pair crosses they go at the slower persons speed.

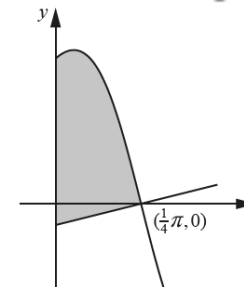
How quickly can they cross the bridge?  
(19 minutes is not good enough)

(@colmanweb)

Answers at [www.colmanweb/easter2020](http://www.colmanweb/easter2020)

A Level

The diagram shows the curve  $y = \frac{4 \cos 2x}{3 - \sin 2x}$ , for  $x \geq 0$ ,  
and the normal to the curve at the point  $(\frac{1}{4}\pi, 0)$ .



Show that the exact area of the shaded region enclosed by the curve, the normal to the curve and the y-axis

OCR, Paper 1, June 2018

## Four Maths Questions at Different Levels – Answers Set 12

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the number of sheep and the number of pigs are in the ratio 2 : 1

The total number of cows, sheep and pigs on the farm is 189

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**70**

Edexcel GCSE, Specimen Papers 2

Harder higher tier GCSE

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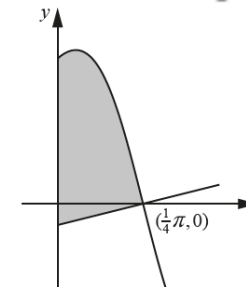
**17 minutes is possible**

(by sending the 5 & 10 minute people together)

(@colmanweb)

A Level

The diagram shows the curve  $y = \frac{4 \cos 2x}{3 - \sin 2x}$ , for  $x \geq 0$ ,  
and the normal to the curve at the point  $(\frac{1}{4}\pi, 0)$ .



Show that the exact area of the shaded region enclosed by the curve, the normal to the curve and the y-axis

is  $\ln \frac{9}{4} + \frac{1}{128} \pi^2$ .

OCR, Paper 1, June 2018