Four Maths Questions at Different Levels – Question Set 1

Easy higher tier GCSE

Solve the simultaneous equations

$$5x + y = 21$$
$$x - 3y = 9$$

Harder higher tier GCSE

There are n sweets in a bag.
6 of the sweets are orange.
The rest of the sweets are yellow.

Hannah takes at random a sweet from the bag.
She eats the sweet.

Hannah then takes at random another sweet from the bag.
She eats the sweet.

The probability that Hannah eats two orange sweets is $\dfrac{1}{3}$

(a) Show that $n^2 - n - 90 = 0$

(b) Solve $n^2 - n - 90 = 0$ to find the value of n.

Something interesting

$$3^{444} + 4^{333}$$

Is the number above a multiple of 5?

A Level

Solve the simultaneous equations

$$e^x - 2e^y = 3$$
$$e^{2x} - 4e^{2y} = 33.$$

Give your answer in an exact form.

Answers at www.colmanweb/easter2020

Four Maths Questions at Different Levels – Answers Set 1

Easy higher tier GCSE

Solve the simultaneous equations

$$5x + y = 21$$
$$x - 3y = 9$$

$$x = 4.5, y = -1.5$$

Harder higher tier GCSE

There are n sweets in a bag.
6 of the sweets are orange.
The rest of the sweets are yellow.

$$n = 10$$

Hannah takes at random a sweet from the bag.
She eats the sweet.

Hannah then takes at random another sweet from the bag.
She eats the sweet.

The probability that Hannah eats two orange sweets is $\frac{1}{3}$

(a) Show that $n^2 - n - 90 = 0$

(b) Solve $n^2 - n - 90 = 0$ to find the value of n.

Something interesting

$$3^{444} + 4^{333}$$

Is the number above a multiple of 5?

Yes, since 3^{4n} ends in 1 and 4^{2n+1} ends in 4
and $1 + 4 = 5$

A Level

Solve the simultaneous equations

$$e^x - 2e^y = 3$$
$$e^{2x} - 4e^{2y} = 33.$$

$$x = ln7, y = ln2$$

Give your answer in an exact form.