

Please attempt the following questions in preparation for the online session on 19th April 2018.

Q1

Evaluate $\log_{10} 25 + \frac{1}{3}\log_{10} 64$.

Q2

Solve the equation $\log_2(x + 1) - 2\log_2 3 = 3$.

Q3

Given that $\log_a 36 - \log_a 4 = \frac{1}{2}$, find the value of a .

Q4

If $f(x) = \log_5 x$, where $x > 0$, sketch the graph of the inverse function f^{-1} .

Q5

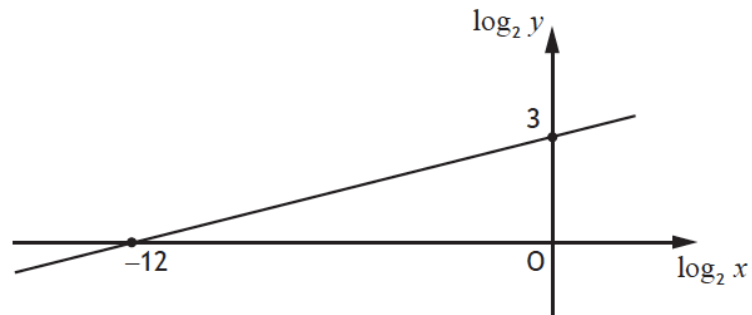
The human population, N , can be modelled by the equation $N = N_0e^{rt}$ where N_0 is the population in 2006, t is the time in years since 2006 and r is the annual rate of increase in the population.

(a) In 2006 the population of the UK was 61 million approx, with an annual rate of increase of 1.6%. Assuming this growth rate remains constant, what would the population be in 2020?

(b) In 2006 the population of Scotland was 5.1 million approx, with an annual rate of increase of 0.43%. Assuming this growth rate remains constant, how long would it take for Scotland's population to double in size?

Q6

Two variables x and y , are connected by the equation $y = kx^n$. The graph of $\log_2 y$ against $\log_2 x$ is a straight line as shown.



Find the values of k and n .