Engineering Maths Tutorial 4

1) Solve the following systems of equations for *x* and *y*

a) $y = x + 3$

$2x - 3y = 2$

b) $x + 4y = 9$

$3x - y = 1$

c) $5x - 6y = 0$

$2x - 5y = -13$

2) Solve the following systems of equations

a) $y = x^2 + 4$

$y = 3x + 2$

b) $y = 2x^2 - 8$

$y = 5x - 10$

c) $5x + y = 18$

$4x^2 - 7y = 15$

3) a) Two positive whole numbers differ by 4. Their squares add to 296. Find the whole numbers.

b) Two positive integers add to 10. Their squares differ by 20. Find the integers.

4) New Zealand's population was 3.86 million in 2000. It is 4.86 million in 2018. Assuming exponential growth (so $P = Ae^{kt}$, where *P* is the NZ population, *t* is the time in years since 2000, *A* and *k* are numbers), find *A* and *k*.
Use your equation to predict:

a) In what year will the NZ population reach 5 million?

b) The population in 2050.