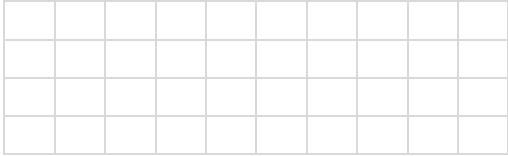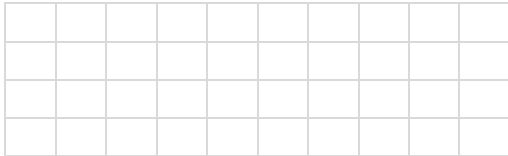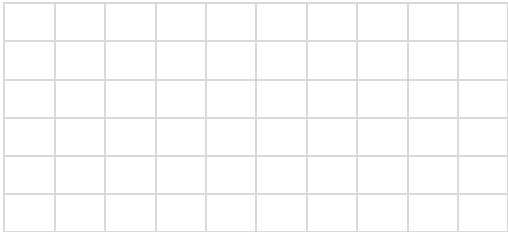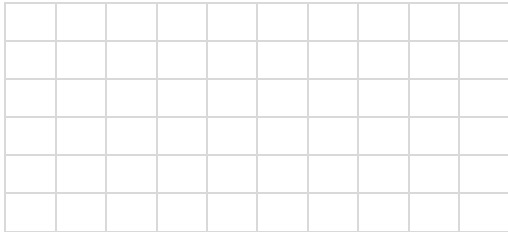# TY Hons Maths – Homework No.6

Name of Student: _____ **For** _____

1. Factorise the following:

(i) $25x^2 - 16y^2$ (ii) $a^3 - a^2b - ab^2 + b^3$ (iii) $x^4 - x$ (iv) $3x^2 - 16x + 5$

(i)

(ii)

(iii)

(iv)

2. Solve the following systems of simultaneous equations: $\begin{cases} x^2 + y^2 = 13 \\ x - y = 1 \end{cases}$
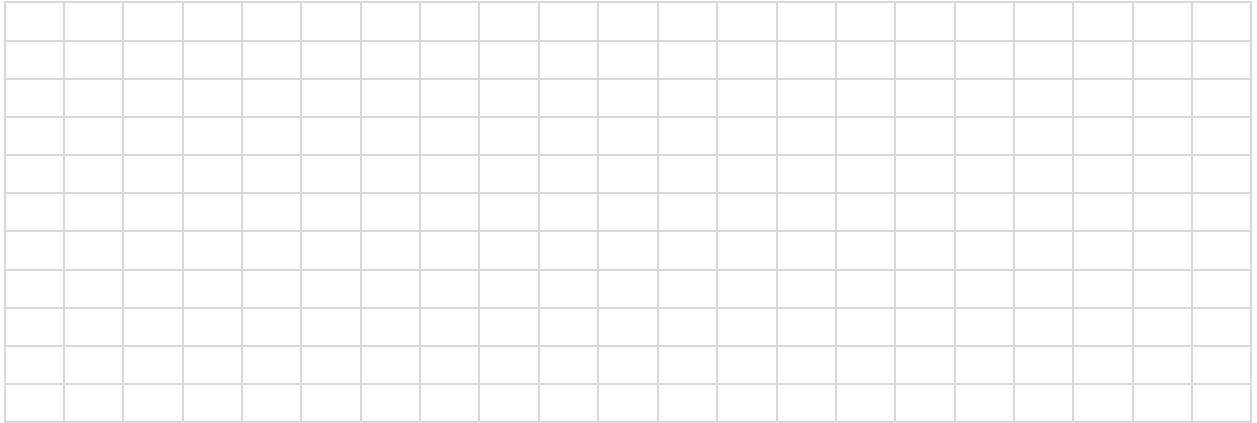
3.

The number of penguins, P, after t years in a new colony can be found using the following formula.

$$P = a \times 2^t$$

(i) If there are 24 penguins after two years, find the value of a.

(ii) How many years will it take for the number of penguins to first exceed 1500?

4. The width of an open rectangular box is 5cm shorter than its length. The height of the box is twice the length. By letting x equal the length of the box, answer the following:

(i) Write down the volume of the box, $V(x)$, in terms of x.
(ii) What is the volume when $x = 7cm$.
(iii) Why can't the box have a length less than 5cm?