Y12**: EXCELLENCE LEVEL B**  .

**ALGEBRA.**

1. Find the value of the constant “c” so that the line ***y = 3x + c*** is a tangent to the

 curve ***y = – 12***

 ***x***

2. A Biological researcher found that the number of bacteria in a culture could be calculated at some future time using a formula of the form ***N = A×bt***

Where ***N*** = the number of bacteria at ***t*** hours. ***A*** and ***b*** are unknown constants.

She estimated that at ***t = 4 hours, N was 5,600 and at t = 7 hours, N was 59,700.***

Use this information to calculate the constants ***A*** and ***b*** then use your formula to estimate the number of bacteria at ***t = 12*** hours.

**CALCULUS**

2. A 40 cm piece of wire is cut into two pieces.

The first piece is shaped into a circle of area A , and the second piece into a square of area B.

Find the minimum value of the total area A + B.