

### **3I Sequences & Series in Context**

1. Bruce starts a new company. He estimates that in Year 1 his profits will be £20000, and he predicts that his profits will increase by £5000 per year from that point on. He then models that once his annual profits reach £100000, they will then remain constant.

a) Calculate the profit for Bruce's business in the first 20 years

b) State a reason why this model might not be suitable

Bruce's financial advisor says that it is more likely that his profits would increase by 5% per year.

c) Using this model instead, calculate the profits that Bruce will make in the first 20 years.

2. A piece of A4 paper is folded in half repeatedly. The thickness of the sheet is 0.5mm.

a) Work out the thickness after 4 folds

b) Work out the thickness after 20 folds

c) State one reason why this might be an unrealistic model