2. Jamie takes out an interest-free loan of £8100

Jamie makes a payment every month to pay back the loan.

Jamie repays £400 in month 1, £390 in month 2, £380 in month 3, and so on, so that the amounts repaid each month form an arithmetic sequence.

(a) Show that Jamie repays £290 in month 12

(1)

After Jamie's Nth payment, the loan is completely paid back.

(b) Show that $N^2 - 81N + 1620 = 0$

(2)

(c) Hence find the value of N.

(2)