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(a)(i) $R = \frac{0.5}{100} + 1$

$= 1.005$

$P = (500)(1.005)^{240} + 500\left(\frac{1.005^{240} - 1}{0.005}\right)$

$= 232175.55$

(ii) (1) $A_1 = (P - 2000) \times 1.005$

$A_2 = \left((P - 2000) \times 1.005^2 - 2000\right) 1.005$

$= P - 2000 \times 1.005^2 \left(1 + 1.005 + 1.005^2\right)$

$A_n = (P - 400000) \times 1.005^n$

$0 = (232175.55 - 400000) \times 1.005^n + 400000$

$-400000 = (232175.55 - 400000) \times 1.005^n$

(b)(i) $0 \leq x \leq 2$

(ii) max value = 2

(iii) $f(6) = 0$

(iv)