

# RECURRENCE RELATIONS

① a)  $u_n = 61$     b)  $u_n = 122$     c)  $u_n = 178.5$     d)  $u_n = +19$   
( $u_1$  was given!)

② a)  $n = 15$     b)  $n = 5$     c)  $u_1 = 4a + 3$   
 $u_2 = 16a + 15$     d)  $u_1 = 2a - 5$   
 $u_2 = 2a^2 - 5a - 5$

e)  $u_0 = 5$     f)  $u_0 = 24$

③ a)  $L = 24$     b)  $L = -32$     c)  $L = -\frac{4}{3}$     d)  $L = \frac{50}{3}$     e)  $L = -160$   
f)  $L = \frac{15}{2}$

④ a)  $u_{n+1} = 1.003u_n - 350$ . (i)  $u_6 = \text{£}938.59$  (ii) 1st Sept,  $\text{£}243.18$

b)  $u_{n+1} = 0.65u_n + 800$     No: limit settles at 2285 tadpoles  
( $> 1500$ ).

c)  $u_{n+1} = 0.35u_n + 35$     Yes: limit settles at 53.8mg ( $< 60\text{mg}$ )

d)  $u_{n+1} = 0.3u_n + 2$     Yes: limit settles at 2.86 cones  
( $< 3$  cones)

⑤ a)  $u_{n+1} = 2u_n + 4$     b)  $u_{n+1} = \frac{1}{2}u_n + 20$     c)  $u_{n+1} = -2u_n - 6$   
d)  $u_{n+1} = 1.2u_n - 3$     e)  $u_{n+1} = -\frac{1}{2}u_n - 2$     f)  $u_{n+1} = \frac{1}{3}u_n + 12$