Project

① How is temperature related to altitude?

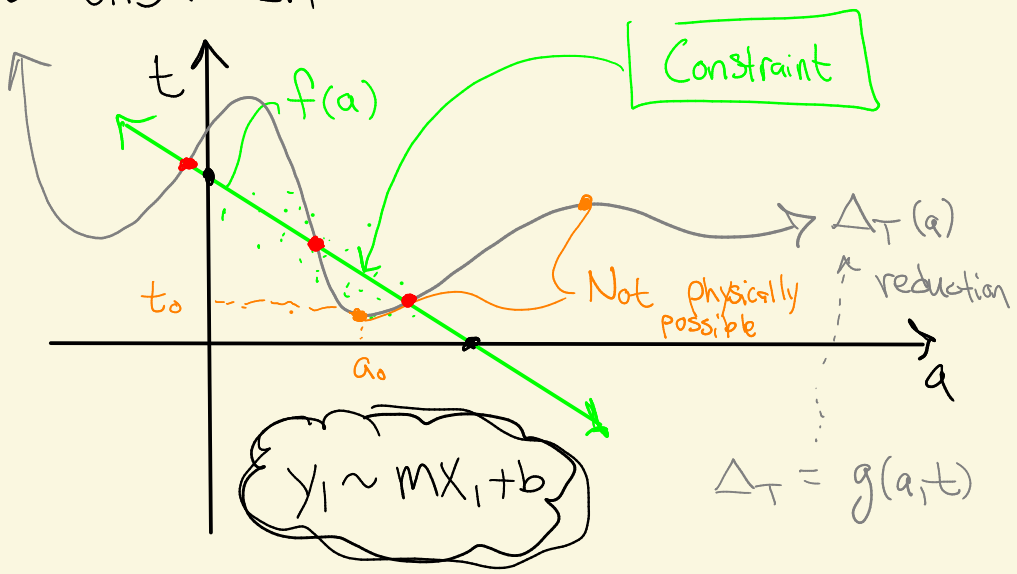
t = temperature] dependent variable (y)

a = altitude] independent variable (x)

- $t = f(a) \rightsquigarrow t = ma + b \rightsquigarrow$ Implicit Relation $c_0 t + d_0 a = b_0$

Ex $0.3t + 0.75a = 12.1$

x_1	y_1
alt.	temps
}	}



- $a = g(t)$

$a = g(t) = \tilde{m}t + \tilde{b}$

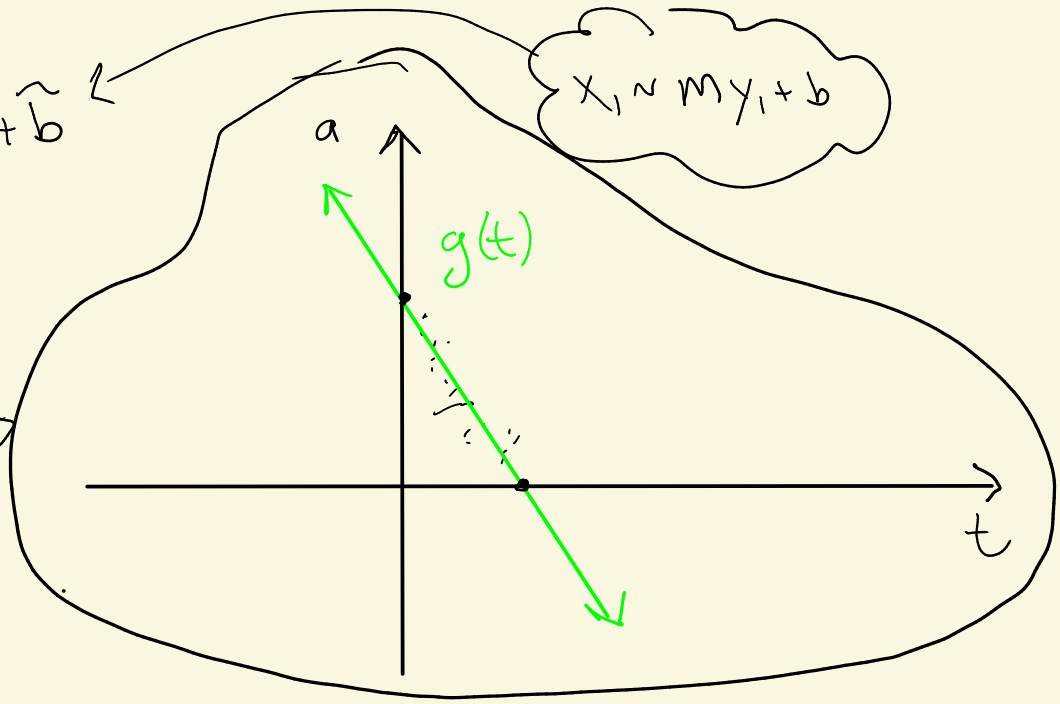


Figure 1

② $\Delta_T = g(a,t)$

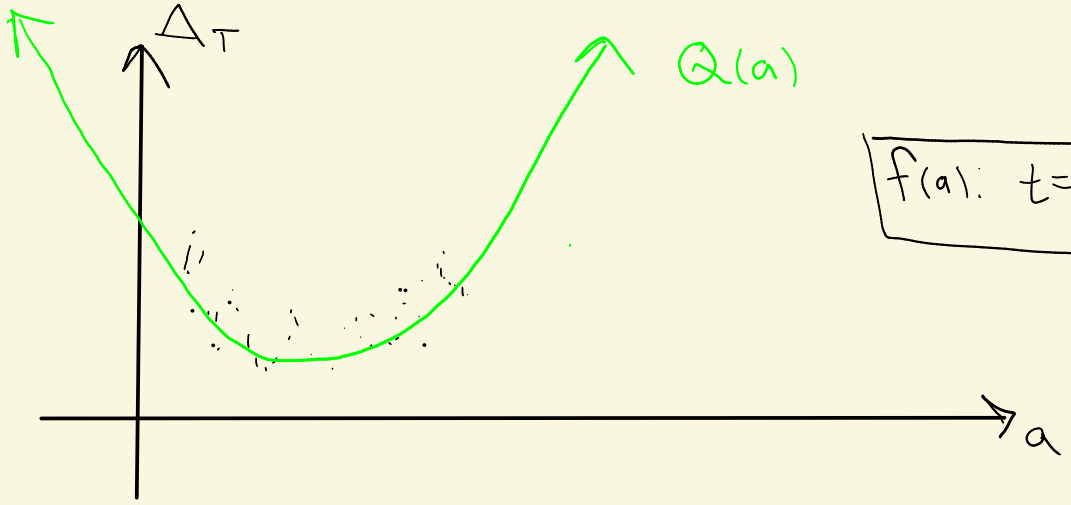
1st Appoximation : $\Delta_T = Q(a) = m_2 a^2 + m_1 a + m_0$

From regression on

X_1	Y_1
altitudes	Interbirth intervals

Regression

$Y_1 \sim m_2 X_1^2 + m_1 X_1 + m_0$



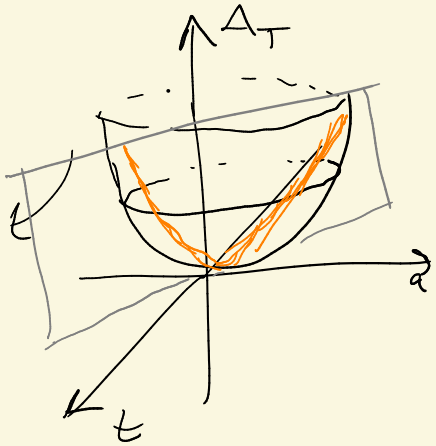
$f(a)$: $t = ma + b$

③ Analysis

numbers to be determined

$\Delta_T = \bar{Q}(a,t) = La(M - t) + N$

Constraint: $t = ma + b$



$\Delta_T = \bar{Q}(a) = La(M - (ma+b)) + N$

$= (?)a^2 + (?)a + (?)$

Algebra

③ ↳ $\bar{Q}(a) = (?)_1 a^2 + (?)_2 a + (?)_3$

② ↳ $Q(a) = m_2 a^2 + m_1 a + m_0$

$10L + 4M + N = 0.125$

$(?)_1$ ↑ m_2

Actual numbers

Solve for L, M, N

$\bar{Q}(a,t) = La(M-t) + N$

Set equal to a number

$10 = 4a(3-t) + 1$

$\Delta_T = 10$

$\Delta_T = 8$

$\Delta_T = 3$

$t = ? + \frac{?}{a}$