

# Calculator Production Problem

Note Title

10/11/2011

$$\frac{dx}{dt} = 3000 \left( 1 - \frac{100}{(t+21)^2} \right) \text{ after } t \text{ weeks}$$

$$\Leftrightarrow dx = 3000 \left( 1 - \frac{100}{(t+21)^2} \right) dt$$

The total number of calculator production from the **beginning** of the 3rd week to the **end** of the 4th week is,

$$\int_2^4 3000 \left( 1 - \frac{100}{(t+21)^2} \right) dt$$

$$= 3000 \cdot \int_2^4 \left( 1 - \frac{100}{(t+21)^2} \right) dt$$

$$= 3000 \left[ t + 100 (t+21)^{-1} \right]_2^4$$

$$= 3000 \cdot \left[ 4 + 100 \cdot \frac{1}{25} - 2 - 100 \cdot \frac{1}{23} \right]$$

$$= 3000 \cdot \left( 2 + 100 \left( \frac{1}{25} - \frac{1}{23} \right) \right)$$

$$= 3000 \cdot (2 - 0.3478 \dots)$$

$$\approx \underline{\underline{5990}} \text{ calculators!}$$

$$\begin{aligned} \int \frac{dt}{(t+21)^2} &= \int (t+21)^{-2} dt \\ &= \frac{1}{-2+1} (t+21)^{-1} \\ &= - (t+21)^{-1} \end{aligned}$$