Section 9.1 Exponential Growth Modeling

$A = A_0 e^{kt}$ ← growth rate

↑ initial amount

ex 3 p656

t, A

(0, 140000)

(1, 149800)

$A = A_0 e^{kt}$

$A = 140000 e^{kt}$

$k \cdot 1$

$\frac{149800}{140000} = \frac{140000e}{140000}$

$1.07 = e^k$

$\ln 1.07 = \ln e^k$

$.0677 = k$

4 places

What is house worth in Jan 2005?

$A = 140000 e^{.0677t}$

$A = 140000 e^{(.0677 \cdot 2)}$

$A = 160{,}299.26$

ex: (0, 100)

(1, 140)

a) Develop model.

b) How long for pop. to double?

a) $A = 100 e^{kt}$

$140 = 100 e^k$

$1.4 = e^k$

$\ln 1.4 = k$

$k = 0.3365$

$A = 100e^{.3365t}$

b) $200 = 100e^{.3365t}$

$A = 200$

$2 = e^{.3365t}$

$\ln 2 = .3365t$

$t = \frac{\ln 2}{.3365} \approx 2.06$ weeks

p667 13-16 (skip 15d, 16d)