




$5x-2y \leq 75$



$\begin{bmatrix} a & b \\ c & d \end{bmatrix}$



$S = Pe^{rt}$



$APY = \left(1 + \frac{r}{n}\right)^n - 1$

### Math 1090 ~ Business Algebra

Section 4.6 Logarithmic and Exponential  
Business Applications

Objectives:

- Solve business application problems using logarithmic function strategies.
- Solve business application problems using exponential function strategies.

Ex 1: If \$1000 is invested at 10% compounded continuously, the future value  $S$  at any time  $t$  (in years) is given by  $S = 1000e^{0.1t}$ .

a) What is the account worth after one year?

b) How long will it take for the investment to double?

Ex 2: The population of Mathville grows according to the formula  $P = P_0 e^{0.03t}$ . If the population was 250,000 in the year 2000, estimate the year in which the population reaches 350,000.

Ex 3: Radioactive Iodine-131 has a half-life of 8 days. How long does it take to reduce an initial amount of Iodine-131 to 1% of the initial amount.

Ex 4: The tsunami of 2004 killed over 200,000 people and was measured at  $M = 9.1$  on the Richter Scale. What was its intensity?  
(Use  $M = \log \left( \frac{I}{I_0} \right)$  where  $I_0 = 10^{-3}$  is the zero level earthquake, or the minimum intensity that can be felt.)

Ex 5: Anneke puts \$350 per month into an investment account to save for her retirement. The account earns 6% interest compounded monthly and the account grows according to this formula

$$S(t) = \frac{300((1.005)^{12t} - 1)}{0.005} \quad \text{where } t \text{ is the number of years she makes the deposits.}$$

How many years must she make monthly deposits in order to have \$1,200,000 in this retirement account?