

Wednesday 12/20 (late start)

Solve the following equation

Q

$$\ln 2^x = \ln e$$
$$\frac{x \cdot \ln 2}{\ln 2} = \frac{1}{\ln 2}$$
$$x = \frac{1}{\ln 2}$$

$$\ln e = 1$$
$$\ln 1 = 0$$
$$\ln 0 \text{ und}$$

$$\log a \cdot b = \log a + \log b$$
$$\log \frac{a}{b} = \log a - \log b$$
$$\log a^b = b \log a$$

$$\log_a b = \frac{\ln b}{\ln a}$$

$$\log_b b = 1$$

$$\log_a 1 = 0$$

$$\log_b b^y = y$$



$$\log_2 2^3 = 3$$

$$\log_b x = y$$
$$b^y = x$$

Section 3.6 Mathematics of Finance

p306

Compound Interest—Value of an Investment

Suppose a principal P is invested at a fixed annual interest rate r . The value of the investment after t years is

- $A = P\left(1 + \frac{r}{k}\right)^{kt}$ when interest compounds k times per year,
- $A = Pe^{rt}$ when interest compounds continuously.

Sample Problem 1

- Find the amount accumulated after investing a principal of 10,000 for 5 years at an interest rate of 7% compounded quarterly

Handwritten solution:

10,000
7% ↓
?

$A = P\left(1 + \frac{r}{k}\right)^{kt}$

Final Amount ← A
Principal ← P
rate a year. ← r
4 times a year. ← k
time ← t
how many times interest is compounded per year ← k

$A = 10,000\left(1 + \frac{0.07}{4}\right)^{4 \cdot 5}$
 $= 14,147.$

- Find the amount accumulated after investing a principal of 10000 for 5 years at an interest rate of 7% compounded annually *once a year*

$$A = P \left(1 + \frac{r}{k} \right)^{kt}$$

$$A = 10,000 \left(1 + \frac{0.07}{1} \right)^{1.5}$$

$$A = 14025.5$$

- Find the amount accumulated after investing a principal of 10000 for 5 years at an interest rate of 7% compounded continuously

$$A = P e^{rt}$$

$$A = 10,000 e^{0.07(5)}$$

$$A = 14190.7$$

$e \approx 2.71 \dots$
euler's number.

$$\ln e = 1$$

$$\ln 1 = 0$$

$$\ln 0 \text{ und}$$

$$\log a \cdot b = \log a + \log b$$

$$\log \frac{a}{b} = \log a - \log b$$

$$\log a^b = b \log a$$

$$\log_a b = \frac{\ln b}{\ln a}$$

$$\log_a 1 = 0$$



$$\log_b b^y = y$$

$$\log_2 2^3 = 3$$

$$\log_b b = 1$$

$$\log_b x = y$$

$$b^y = x$$

P310 #1-12

• Review Problems:

p314: 5-8, 19-22, 27-34, 35-38, 43-50 (no

calc),

53,54,59,62,63,64,74,

75