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GPS # 31 3.5 EXPONENTIAL FUNCTIONS AND INVESTING Class Time: 11:30 - 12:45 Date: 3/13/08

Useful Guidelines:

If P is the amount invested at an interest rate r per year, the future value S at the end of t years is

* $S = P(1+r)^t$, with annual compounding.

* $S = P(1+\frac{r}{k})^{kt}$, with periodic compounding.

[Periodic compounding: the interest is compounded k times per year and the interest rate per period is $\frac{r}{k}$.]

1. If \$4,400 is invested for t years at 6% interest compounded annually, find the future value that results in

a) 10 years

$P = 4,400$
$r = 0.06$
$t = 10$ years
$S = P(1+r)^t$
$= 4,400(1+0.06)^{10}$
$= \$7879.73$ Future value

b) 20 years

$P = 4,400$
$r = 0.06$
$t = 20$ years
$S = P(1+r)^t$
$S = 4,400(1+0.06)^{20}$
$= \$14,111.40$ Future value

2. If \$20,000 is invested at 8% interest compounded quarterly, find the future value in

a) 20 years

$P = 20,000$
$r = 0.08$
$t = 20$ years
$K = 4$
$S = P(1+r/K)^{Kt}$
$= 20,000(1+0.08/4)^{(4)(20)}$
$= 20,000(1+.02)^{80}$
$= \$97,508.78$ Future value

b) 30 years

$P = 20,000$
$r = 0.08$
$t = 30$ years
$K = 4$
$S = P(1+r/K)^{Kt}$
$= 20,000(1+0.08/4)^{(4)(30)}$
$= 20,000(1+0.02)^{120}$
$= \$$

3. If \$5,000 is invested at 12% interest compounded monthly, find the interest earned in 10 years.

$P = 5,000$
$r = 0.12$
$t = 10$ years
$K = 12$
$S = P(1+r/K)^{Kt}$

$S = 5,000(1+0.12/12)^{(12)(10)}$
$= 5,000(1+.01)^{120}$
$= \$6,501.93$ Future value