Level 1 Problems – solving for y

1. If you buy a house for $350,000 that is expected to appreciate at about 6% each year, what would the selling price of the house be in five years? Round to the nearest cent.

$y = a(1+r)^t \quad y = 350,000(1 + .06)^5 = \$468,378.95$

2. If you buy a house for $425,000 that winds up depreciating in value by about 4% every year, what would the appraisal price be of the house in five years? Round to the nearest cent.

$y = a(1-r)^t \quad y = 425,000(1 - .04)^5 = \$346,533.40$

3. If you deposit $1000 into an account paying 2.5% annual interest, compounded monthly. What is the balance after 8 years? Round to the nearest cent.

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

$A = 1000\left(1 + \frac{.025}{12}\right)^{(12 \cdot 8)} = \$1,221.45$

4. Suppose you deposit $700 into an account paying 6% annual interest, compounded continuously. What is the balance after 8 years? Round to the nearest cent.

$A = Pe^{rt}$

$A = 700e^{(.06 \cdot 8)} = \$1131.25$

5. A population of fish starts at 8000 in the year 2010 and, due to changes in its environment, decreases continuously by 5.8% per year. What will the population of fish be in 2020? Round to the nearest hundredth.

$y = ae^{-kt}$

$y = 8000e^{(-.058 \cdot 10)}$

$y = 4479.19$ fish

Level 2 Problems – solving for initial value

1. You bought a car that winds up depreciating in value by about 4% every year. In six years the car is said to be worth $17,220.67. What was the original price of the car? Round to the nearest dollar.

$y = a(1-r)^t$

$17,220.67 = a(1 - .04)^6$

$\frac{17,220.67}{(1-.04)^6} = a$

$\$22,000 = a$

2. Suppose you have $672.97 in a savings account that pays 3.9% annual interest. Assuming that no deposits or withdrawals were made, how much did you originally deposit into your account if you've had the account open for 3 years? Round to the nearest dollar.

$y = a(1+r)^t$

$672.97 = a(1 + .039)^3$

$\frac{672.97}{(1+.039)^3} = a \longrightarrow \$600.00$

3. How much should you invest in an account that pays 3.5% annual interest compounded monthly if you want $7091.72 in the account after 10 years? Round to the nearest dollar.

3. $A = P\left(1 + \frac{r}{n}\right)^{nt}$

$7091.72 = P\left(1 + \frac{.035}{12}\right)^{(12 \cdot 10)}$

$\frac{7091.72}{\left(1 + \frac{.035}{12}\right)^{(12 \cdot 10)}} = P$

$\$5000 = P$

4. How much should you invest in an account that pays 6% annual interest compounded continuously if you want exactly $8000 after four years? Round to the nearest dollar.

4. $y = Pe^{rt}$

$8000 = Pe^{(.06 \cdot 4)}$

$\frac{8000}{e^{(.06)(4)}} = P$

$\$6,293 = P$