Compound Interest 2

Name:



If you invest money with interest compounded n times a year, you can determine the value of the account after x years using the formula $A = P(1 + \frac{r}{n})^m$ where A = value of the investment in dollars after t years, P = principal invested (i.e. the starting value in dollars), r = annual interest rate, and n = number of times compounded per year. Answer the questions below.

- 1) Suppose you invest \$10,000 in an account that has an annual interest rate of 1.6%.
- a) Write an equation that expresses the amount of money you have in this account if interest is compounded annually. Then find how much money you'd have in the account after 1 year? After 10 years? Round to nearest cent.

x years: $y = 10,000 (1 + .016)^{1/2}$

1 year: $y = 10,000 (1 + .016)^{1} \Rightarrow $10,160$

10 years: $y = 10,000 (1+.010)^{10} \rightarrow $11,720.26$

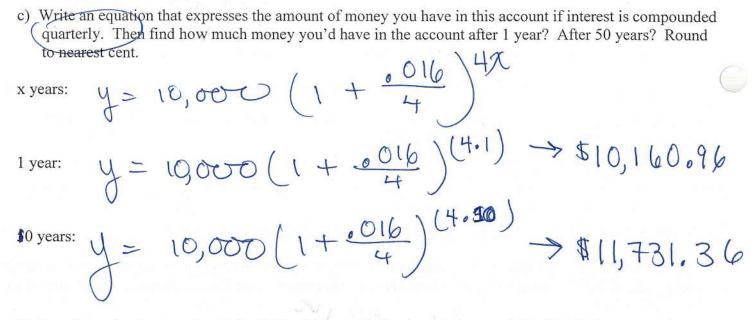
b) Write an equation that expresses the amount of money you have in this account if interest is compounded semi-annually. Then find how much money you'd have in the account after 1 year? After 20 years? Round to nearest cent.

x vears:

1 year:

$$y = 10,000 \left(1 + \frac{0016}{2}\right)^{\frac{3.1}{2}} \rightarrow 410,160.64$$

10 years:



2) Sometimes banks advertise their APY, which stands for <u>annual percent yield</u>. This is the percent interest that will be added to an account at the end of the year and it's <u>not</u> always the same as the annual interest that the bank offers. How could this be?

yes. See questions 1 a-c! The more frequently a bank compounds interest, the more money yer earn in interest.

3) Which investment would make more money at the end of a 5-year period?

Investment A: Invest \$100,000 in 60 month CD with 3.05% interest rate compounded continuously.

<u>Investment B</u>: Invest \$100,000 in money market account that has 3.1% interest rate compounded quarterly.

Show your work and explain your thinking below. Make sure you convince us that your answer is correct.

A:
$$y = 100,000(1 + \frac{0305}{365})$$
 $= $103,096.86$

B: $y = 100,000(1 + \frac{031}{4})$
 $= $103,085.06$

Units

A: $y = 100,000(1 + \frac{031}{4})$
 $= $103,085.06$