PCFU (B10-B11): Comparing Interests Name: _____

Jennifer's parents were offered four options for investing $5000 to help Jennifer pay for college. Calculate how much money Jennifer would have for college for each of the options. Be sure to show your work clearly! Then determine which option is the best for Jennifer. Jennifer will be able to go to college 15 years from now.

Option One: An account that earns an annual interest of 2.34% compounded monthly.	**Option Two:** An account that earns an annual interest of 2.5% compounded quarterly.	**Option Three:** An account that earns $150 each year.	**Option Four:** An account that earns an annual interest of 2.43% compounded continuously.
I know I need to use the compound interest formula since option one earns interest monthly. I know $A_0 = 5000$ because the initial amount of money invested was $5000. I know $r = .0234$ because the interest rate is 2.34% which is .0234 when written as a decimal. I know $n = 12$ because the interest is compounded monthly which is 12 times a year. I know $t = 15$ because Jennifer goes to college 15 years from now. Therefore, $A(15) = 5000(1 + \frac{.0234}{12})^{12(15)}$ Jennifer would have $7100.01.	I know I need to use the compound interest formula since option two earns interest quarterly. I know $A_0 = 5000$ because the initial amount of money invested was $5000. I know $r = .025$ because the interest rate is 2.5% which is .025 when written as a decimal. I know $n = 4$ because the interest is compounded quarterly which is 4 times a year. I know $t = 15$ because Jennifer goes to college 15 years from now. Therefore, $A(15) = 5000(1 + \frac{.025}{4})^{4(15)}$ Jennifer would have $7266.47.	I know I need to use a linear equation ($y=mx+b$) because option three is earning a constant amount of money per year. I know $m=150$ because the account is earning $150 per year. I know $b = 5000$ because the initial amount of money invested was $5000. I know $x = 15$ because Jennifer goes to college 15 years from now. Therefore, $y = 150(15) + 5000$ Jennifer would have $7250.	I know I need to use the compounded continuously formula since option four earns interest continuously. I know $A_0 = 5000$ because the initial amount of money invested was $5000. I know $r = .0243$ because the interest rate is 2.43% which is .0243 when written as a decimal. I know $t = 15$ because Jennifer goes to college 15 years from now. Therefore, $A(15) = 5000e^{(.0243)(15)}$ Jennifer would have $7198.97

Option two is the best option for Jennifer because it would give her the most money in 15 years.

Additional Practice:

1. Describe each piece of the formula:

$$A(t) = A_0\left(1 + \frac{r}{n}\right)^{nt}$$

A_0 =

r =

n =

t =

A(t) =

2. Describe each piece of the formula:

$$A(t) = A_0 e^{rt}$$

A_0 =

e =

r =

t =

A(t) =

3. Mr. George invests $800 in an account which pays 20% interest compounded semiannually. Find the amount of money Mr. George has in his account after 2 years.

4. Would Mr. George have more money or less money if he invested his money in an account with the same interest rate that is compounded continuously? Explain your reasoning.

How much more or less money would Mr. George have?