

Name: Key

Applications

1.) Kay invests \$5,000 for years into an account compounded continuously at a rate of 4.5%. What is the balance after 6 years?

$$y = Pe^{rt} \quad y = 5000e^{.045(6)} \quad \$ \underline{6549.82}$$
$$y = 6,549.82$$

2.) Ted wants to triple his money. It is in an account that pays 5% interest compounded continuously, how long will it take to triple his money?

$$y = Pe^{rt} \quad 3 = 1e^{.05t} \quad t = 21.97$$
$$\ln(3) = .05t \quad \approx \underline{22 \text{ years}}$$

3.) Jose's' car depreciates at a rate of 12% per year. He bought his car three years ago for \$25,000, how much is it worth today?

decay

$$y = P(1-r)^t \quad y = 25000(1-.12)^3 \quad t=3$$
$$\$ 17,036.80$$

4.) Aneisha deposited \$7,000 into an account paying 3.5% interest compounded semi-annually. If she leaves her money in the account for four years what would be her account BALANCE? (Balance – initial investment plus interest)

$$y = P(1 + \frac{r}{n})^{nt} \quad y = 7000(1 + \frac{.035}{2})^{2(4)} \quad n=2$$
$$= \underline{\$ 8042.17 \text{ balance}}$$

(1,042.17 interest earned)

5.) A radioactive sample has a half-life of 3 years and has an initial mass of 68 grams. How many months will it take the sample to lose 8 grams?

$$y = P(\frac{1}{2})^{t/h} \quad 60 = 68(\frac{1}{2})^{t/36} \quad t = 6.5 \text{ months}$$

3yr = 36 months

$$\frac{60}{68} = (\frac{1}{2})^{t/36}$$
$$\log_{1/2}(\frac{60}{68}) = t/36$$

6.) The population of a town triples every 6 years. If 4000 people are present in 2016, how many people will be in the town in 2026?

$$y = P(1+r)^t \quad y = 4000(1+2)^{10/6}$$

increases 200%

$$= 4000 \cdot (3)^{5/3}$$
$$= \underline{24,961 \text{ people}}$$