

CAL 12**Derivatives with Logs and Exponentials**

1. \$50 000 is invested in a fund which guarantees that the money will increase by 10% every 2 years. At what rate (in dollars per year) is the investment growing at the 10 year point?
2. A colony of bacteria is growing continuously at the rate of 30% per day. If the initial colony has a population of one million, at what rate is it growing after one full week?
3. Homer and Marge foolishly gave their children 6 rabbits for Easter. If these creatures are able to double in number every 3 months, at what rate is the rabbit population increasing at the Simpsons after 2 years?
4. A new car depreciates by 20% per year. At what rate is a \$100 000 Hummer depreciating exactly 4 years after being purchased?
5. For the equation: $x = 3^y$ at what rate is y changing when $x = 7$?