

7. [7 points]

- a. [3 points] A new car was sold at 35 thousand dollars. Its value depreciates 5.4 percent every year. Let  $V(t)$  be the value of the car, in thousand dollars,  $t$  years after it was sold. Find a formula for  $V(t)$ .

$$\boxed{\text{Solution: } V(t) = 35(1 - 0.054)^t = 35(0.946)^t}$$

- b. [4 points] Let  $B(t)$  be the population of bats in a cave  $t$  years after 2000, where

$$B(t) = 300(1.152)^{2t}$$

1. How many bats are in the cave in 2015?

$$\boxed{\text{Solution: } B(15) = 300(1.152)^{30} \approx 20926.45}$$

2. What is the annual percentage growth rate of this population? Your answer must be **exact** or accurate up to the first three decimals. Show all your work.

$$\boxed{\text{Solution: } \text{Since } b = (1.152)^2, \text{ then } r = (1.152)^2 - 1 \approx 0.327}$$