

### Math 148 Quiz #3 Answers

1. (a) At time 0, the balance is  $B = 1500(1.08)^0 = \boxed{\$1500.}$
- (b)  $B'(t) = 1500(1.08)^t \cdot \ln(1.08) \Rightarrow B'(10) = 1500(1.08)^{10} \cdot \ln(1.08) = \boxed{249.23 \text{ dollars/year}}$
- (c)  $\boxed{\text{Between the 10th and the 11th year, the account balance will increase by **approx** \$249.23.}}$
2. (a)  $g'(x) = 12e^{0.5x}(0.5) - \frac{1}{9x}(9) + 3.1 = \boxed{6e^{0.5x} - \frac{1}{x} + 3.1}$
- (b)  $h'(p) = \boxed{\frac{1}{3}(p^5 + p)^{-2/3} \cdot (5p^4 + 1)}$
3. (a) Fixed Cost =  $C(0) = 100(0 - 5)^3 + 500,000 = \boxed{\$487,500}$
- (b) Note: 1500 items  $\rightarrow q = 1.5$  (since  $q$  is in thousands)  
 $MC(q) = C'(q) = 300(q - 5)^2 \Rightarrow MC(1.5) = \boxed{3675 \text{ dollars/thousand cars}}$