

## Math 148 Quiz #2 Answers

1. (a) The units are  $\boxed{\text{ducks/day}}$ .
  - (b)  $\boxed{\text{There are 70 ducks in the park on day 25 and there will be approximately 3 fewer ducks on day 26.}}$
  - (c) There will be approximately  $70 - 2(3) = \boxed{64 \text{ ducks}}$  on day 27. (Assuming the number of ducks reduces by approximately 3 each day.)
2. (a)  $\boxed{g'(x) = -32x^7 + \frac{2}{3}}$  (Note:  $\sqrt[4]{5}$  is a constant, so its derivative is 0.)
  - (b) Simplify  $h(t)$  to  $h(t) = 8t^{-1} + t^{-1/2}$ . So, the derivative is  $\boxed{h'(t) = -8t^{-2} - \frac{1}{2}t^{-3/2}}$
3. The point of tangency is  $(3, f(3)) = (3, 16)$ .

The slope is given by  $f'(3)$ . Since  $f'(x) = x^2 + 1$ , we have that  $f'(3) = 10$ .

So, the equation of the line is  $\boxed{y - 16 = 10(x - 3) \quad \text{or} \quad y = 10x - 14.}$