Name:

Quiz 6: §2.4-3.1

Complete the following problems to the best of your ability. **SHOW ALL OF YOUR WORK.** Unshown work will not be graded. You may use a calculator.

1. [60] Find the equations of the following functions.

   (a) A linear function parallel to the function $x = 4$ that goes through the point $(-1, 2)$.

   (b) A linear function perpendicular to $y = \frac{1}{3}x - 2$ that goes through the point $(2, 2)$.

   (c) An exponential function with initial value 100 and growth factor of 1.3.

   (d) An exponential function with initial value 4 decreasing at a rate of 5.6 %.

(e) An exponential function going through the point $(0, 16)$ increasing at a rate of 100 %.

(f) An exponential function with y-intercept of 1 with a decay factor of .875.

2. A black cat is running along a fence, chasing a white cat who has stolen her fish. When the black cat notices her fish is missing, the white cat is already 18 meters away. The white cat is running at 8 m/s, but the black cat pursues him at 12 m/s.

   (a) [20] Find two functions that give the position of the black cat and the white cat at a time t in seconds after the black cat starts running.

   (b) [10] Will the black cat catch up? How long will it take until she does?

   (c) [10] How far does the white cat get until the black cat catches him?