QUIZ 8 - MATH 111 Your Name:

Read each problem **very carefully** before starting to solve it. Each problem is worth 5 points. It is necessary to show **all** your work. Correct answers without explanations are worth 0 points. GOOD LUCK!!

1. You have invested money in a savings account that pays a fixed monthly interest on the account balance. The following table shows the account balance over the first 5 months:

Time in months	0	1	2	3	4	5
Savings balance	\$1750.00	\$1771.00	\$1792.25	\$1813.76	\$1835.52	\$1857.55

- (a) How much money was originally invested?
- (b) Show that the data are exponential and find an exponential model for the account balance. Explain the meaning of your variables and the corresponding units.

- (c) What is the monthly interest rate?
- (d) What is the yearly interest rate? Show your work.
- (e) Suppose that you created this account on the occasion of the birth of your daughter. The plan is to leave the money in the account until she starts college at age 18. How large will her college fund be then?
- (f) How long does it take for your money to double in value?

2. A biological study showed that the maximum length a haddock could be expected to grow is about 53 cm. Let D = D(t) denote the difference between 53 cm and the length at age t years. The table below gives the experimentally collected values for D:

Age t	2	5	7	13	19
Difference D	28.2	16.1	9.5	3.3	1.0

(a) Find an exponential model of D as a function of t.

(b) Let L(t) be the length in cm of a haddock at age t years. Find a model for L as a function of t.

(c) **Plot** the experimentally collected data for the length L and the graph of your model for L. Is the 5-year-old haddock a bit shorter or a bit longer than would be expected?

(d) A fisherman has caught a haddock that measures 41 cm. What is the approximate age of the haddock? Explain your work.