0.013607

Term Test B version 1

$\frac{\ln 2}{\ln 1.0137} =$ 50.9405

99.969 min

(1) [5 points] How long will it take the world population to double at an exponential growth rate of 1.37% per year?

(2) [5 points] Suppose we are preparing a lovely *Canard à l'Orange* (roast duck with orange sauce). We first take our duck out of a 36°F refrigerator and place it in a 350°F oven to roast. After 10 minutes the internal temperature is 53°F. If we want to roast the duck until just under well-done (about 170°F internally), when will it be ready?

(3) [5 points] Rewrite the expression as a single logarithm,

$$2(\log_5 x + 2\log_5 y - 3\log_5 z)$$

$\log \frac{x^2 y^4}{z^6}$

(4) [5 points] Solve the following equation,

$$3^{x^2} = 175^{x-1}$$

$0 = x^2 \ln 3 - x \ln 175 + \ln 75$

(5) [5 points] Solve the following equation,

$$\ln 2x - \ln 4 + \ln(x-2) = 1$$

$S = \{3.537\}$

not: -1.537

(6) [5 points] Suppose that you plan to need \$10,000 in thirty-six months' time when your child starts attending university. You want to invest in an instrument yielding 3.5% interest per year, compounded monthly. How much should you invest? Use the formula

$$A = P\left(1 + \frac{r}{m}\right)^{mt}$$

9003.54

9004.62

(7) [5 points] Rewrite so that there is no logarithm of a product, quotient, root, or power,

$$\ln \frac{x^3\sqrt{x-1}}{3x+4}$$

$3\ln x + \frac{1}{2}\ln(x-1) - \ln(3x+4)$

(8) [5 points] Evaluate without a calculator. Show all of your work.

$$\log_4\left(2 \cdot \sqrt{32}\right) + \log_{27}\sqrt{3}$$

$\log 4^{\frac{7}{4}} + \log 27^{\frac{1}{6}} = \frac{7}{4} + \frac{1}{6} = \frac{23}{12}$