

#### Quiz #4

**Problem 1:** Consider the function  $f(x) = 2x^3 + 2$ .

- Show that  $f(x)$  is “1-1”.
- Find inverse function of  $f(x)$ .
- Verify your answer in *b)* algebraically.
- Plot both  $f(x)$  and its inverse.

**Problem 2:** Consider  $g(x) = 1 - e^{-x}$ .

- Graph  $g(x)$ .
- Give equations of all asymptotes.
- Find  $x$  and  $y$  intercepts.
- What is domain of  $g(x)$ ?
- What is range of  $g(x)$ ?
- Evaluate  $g(3)$ .

**Problem 3:** Solve the following equation

$$\left(\frac{1}{4}\right)^{3-x} = 2.$$

**Problem 4:**

- Rewrite  $2^x = 3$  in logarithmic form.
- Rewrite  $\log_6 y = 5$  in exponential form.

**Problem 5:** Consider  $h(x) = \ln(x - 2)$ .

- Graph  $h(x)$ .
- Find  $x$  and  $y$  intercepts.
- What is domain of  $h(x)$ ?
- What is range of  $h(x)$ ?

**Problem 6:** Solve equation  $\ln(x - 3) = 2$ .

**Problem 7:** Determine if the following is true or false in general.

- $\ln(2x + 1) = \ln 2x + \ln 1$
- $e^{2x+1} = e^{2x} \cdot e$
- $\log_2 x^4 = 4 \log_2 x$
- $(\log x)^3 = 3 \log x$
- $\log_3 x = \frac{\ln 3}{\ln x}$ .

**Problem 8:** Solve equation

$$2 \log_3 x = \log_3 16.$$

**Problem 9:** Solve equation

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

**Problem 10:** Solve equation

$$5^x = 3^{(3x+1)}.$$

**Problem 11:** A 50\$ investment has been compounded quarterly. What amount results from the investment after a period of two years if the rate is 4.99%?

**Problem 12:** A radioactive material leaked into a field and now the field is contaminated with it. If the half-life of the toxic material is 8 days and if it is all right to feed the live stock when 10% of the material remains, how long does it take for the field to be usable again?

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