

## LECTURE NOTES: §1.4 & 1.5

1. On the same set of axes, graph  $f(x) = 2^x$ ,  $g(x) = e^x$ ,  $h(x) = 10^x$ , and  $k(x) = \left(\frac{1}{2}\right)^x$ .

2. Assume  $a > 0$ . What is the domain and range of  $f(x) = a^x$ ? Asymptotes?

3. Without the use of a calculator, compute the following:

(a)  $\log_2 \frac{1}{16} =$

(b)  $\ln e^{0.24} =$

(c)  $e^{5 \ln x} =$

4. On the same set of axes, graph  $f(x) = e^x$  and  $g(x) = \ln x$ .

5. Solve the following equations for  $x$ .

(a)  $\ln(x + 5) - 1 = 7$

(b)  $e^{2x-5} + 4 = 10$

6. Are the following statements true or false? If either case, explain why. If possible, change the false statements so that they are a true statement.

(a)  $(a + b)^2 = a^2 + b^2$

(b)  $\sqrt{x^2 + 4} = x + 2$

(c)  $\frac{a + b}{c + d} = \frac{a}{c} + \frac{b}{d}$

(d)  $\frac{a + b}{c} = \frac{a}{c} + \frac{b}{c}$

(e)  $\ln(x + y) = \ln x + \ln y$

(f)  $\frac{\ln x}{\ln y} = \ln\left(\frac{x}{y}\right)$

(g)  $\ln(x - y) = \ln\left(\frac{x}{y}\right)$

(h)  $f^{-1}(x) = \frac{1}{f(x)}$

(i)  $f^2(x) = (f(x))^2$