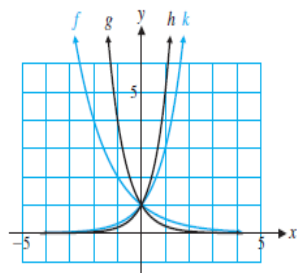


Faculty of Business Administration
MAT101-Mathematics I / 2019 Fall
Exercise-3: Exponential and Logarithmic Functions



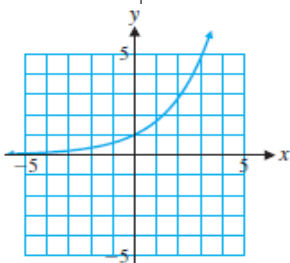
1. Match each equation with the graph of f, g, h, or k in the figure.

a) $y = \left(\frac{1}{4}\right)^x$

b) $y = (0.5)^x$

c) $y = 5^x$

d) $y = 3^x$



2. Use the graph of f shown in the figure to sketch the graph of each of the following.

a) $y = f(x) - 1$

b) $y = f(x+2)$

c) $y = 3f(x) - 2$

d) $y = 2 - f(x-3)$

3. Solve each equation for x.

a) $10^{2-3x} = 10^{5x-6}$

b) $4^{5x-x^2} = 4^{-6}$

c) $5^3 = (x+2)^3$

d) $(1-x)^5 = (2x-1)^5$

4. Solve each equation for x. (Remember: $e^x \neq 0$ and $e^{-x} \neq 0$ for all values of x).

a) $xe^{-x} + 7e^{-x} = 0$

b) $x^2e^{-x} - 9e^{-x} = 0$

c) $e^{3x-1} - e = 0$

5. Find the value of an investment of \$10000 in 12 years if it earns an annual rate of 3.95% compounded continuously.

6. Find the value of an investment of \$24000 in 7 years if it earns an annual rate of 4.35% compounded continuously.

7. Suppose that \$4000 is invested at 6% compounded weekly. How much money will be in the account in 1/2 year? 15 years?

8. A person wishes to have \$15000 cash for a new car 5 years from now. How much should be placed in an account now, if the account pays 6.75% compounded weekly? Compute the answer to the nearest dollar.

9. A couple just had a baby. How much should they invest now at 5.5% compounded daily in order to have \$40000 for the child's education 17 years from now? Compute the answer to the nearest dollar.

10. Change each logarithmic form to an equivalent exponential form:

a) $\log_5 25 = 2$

b) $\log_9 3 = \frac{1}{2}$

c) $\log_2 \frac{1}{4} = -2$

11. Change each exponential form to an equivalent logarithmic form:

a) $49 = 7^2$

b) $36 = 6^2$

c) $8 = 4^{3/2}$

12. Find x or y without a calculator.

a) $\log_3 x = 2$

b) $\log_5 25 = y$

c) $\log_{25} x = \frac{1}{2}$

13. Find x in the following equations.

a) $\log_b x = \frac{2}{3} \log_b 8 + \frac{1}{2} \log_b 9 - \log_b 6$

b) $\log_b x + \log_b (x-4) = \log_b 21$

c) $\log_{10} (x+6) - \log_{10} (x-3) = 1$

- 14.** In its first 10 years the Gabelli Growth Fund produced an average annual return of 21.36 %. Assume that money invested in this fund continues to earn 21.36 % compounded annually. How long will it take money invested in this fund to double?
- 15.** How many years (to two decimal places) will it take \$1000 to grow to \$1800 if it is invested at 6% compounded quarterly? Compounded daily?
- 16.** How many years (to two decimal places) will it take \$5000 to grow to \$7500 if it is invested at 8% compounded semiannually? Compounded monthly?
- 17.** How many years (to two decimal places) will it take an investment of \$35000 to grow to \$50000 if it is invested at 4.75% compounded continuously?
- 18.** How many years (to two decimal places) will it take an investment of \$17000 to grow to \$41000 if it is invested at 0.95% compounded continuously?