

1. For each of the following, sketch the graph of the function, find the domain and range of the function, find any  $x$ - or  $y$ -intercepts or state that none exist, identify any asymptotes, describe the end-behavior.

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

(b)  $f(x) = 2^{-x}$

(c)  $f(x) = -2^x$

(d)  $f(x) = \frac{2^x}{3}$

(e)  $f(x) = 4 - 2^x$

(f)  $f(x) = 7 + 2^{x-1}$

(g)  $f(x) = \left(\frac{1}{2}\right)^x$

2. On the same set of axes, graph  $f(x) = 2^x$ ,  $f(x) = 3^x$ ,  $f(x) = 4^x$ ,  $f(x) = (1/2)^x$ ,  $f(x) = (1/3)^x$ ,  $f(x) = (1/4)^x$ .
3. Let  $f(x)$  be an exponential function of the form  $f(x) = a^x$  that contains the point  $(3, \frac{1}{5})$ , find  $f(x)$ .
4. Given that formula  $A(t) = P(1 + \frac{r}{n})^{nt}$  is the standard formula for compound interest, what do each of the following represent?
- (a)  $A(t)$
  - (b)  $P$
  - (c)  $r$
  - (d)  $n$
  - (e)  $t$
5. How much money has accumulated in an account with principle of \$1000 with an interest rate of 2% per year, compounded quarterly after 10 years?

6. Without using a calculator, find an exact expression and a rough approximation for each of the values below assuming  $f(x) = e^x$ .
- (a)  $f(0)$
  - (b)  $f(1)$
  - (c)  $f(-1)$
7. On the same set of axes, graph  $f(x) = 2^x$ ,  $f(x) = 3^x$ ,  $f(x) = e^x$ .
8. (True or False) Explain your answer.
- (a)  $f(x) = e^{x^2}$  and  $g(x) = (e^x)^2$  are equal.
  - (b)  $h(x) = e^{2x+3}$  and  $k(x) = e^3 \cdot (e^x)^2$  are the same function.
9. Are exponential functions one-to-one?