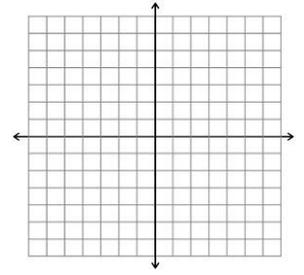


Graph the following exponential function and describe its transformation from the graph  $g(x) = \log_2 x$ . State the domain and range.

1.  $f(x) = 2\log_2(x - 4) + 3$

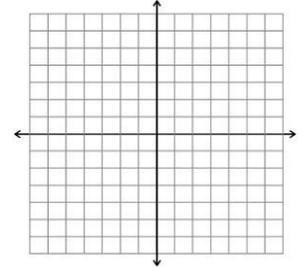
2. You deposit \$1800 in an account that earns 6.4% annual interest. Find the time it takes to double the amount if the interest is compounded quarterly.



3. Simplify:  $2e^{3x} \cdot 4e^{-5x} \cdot 6e^{2x-3}$

4. Graph the following function and describe its transformation from the graph  $y = \log_4 x$ . Also state its domain and range.

$f(x) = -\log_4(x + 1) + 2$



Rewrite the following in either exponential form or logarithmic form.

5.  $\log_4 64 = 3$

6.  $8^{1/3} = 2$

Evaluate the logarithmic functions without a calculator. No decimal answers.

7.  $\log_3 9$

8.  $\log_2 \frac{1}{16}$

Simplify the following using inverse properties. No decimal answers.

9.  $\log_3 27^x - e^{\ln 4} + \log_2 16$

10.  $\log_4 64^{-3x}$

Evaluate the following logarithmic expressions using

$\log 4 \approx 0.602$  and  $\log 7 \approx 0.845$ .

11.  $\log \frac{7}{16}$

Expand the following expression:

12.  $\log 7 \frac{12x^8}{8y}$

Condense the following expression:

13.  $\log 8 + \frac{1}{2} \log 9 - \log 2$

**Evaluate the following using the change of base formula. Give the exact solution.**

14.  $\log_8 6$

**Solve the following exponential equations. Round to 2 decimal places.**

15.  $16^{3x} = 4^{x-4}$

16.  $7^x + 2 = 16$

17. How long would it take for \$5000, invested in an account earning 7% compounded continuously, to earn \$1000 in interest?

**Solve the following logarithmic equations.**

**Round to 2 decimal places.**

18.  $\log_4 5x = \log_4 (7x - 8)$

19.  $\log x + \log (x + 2) = \log 35$

**Simplify:**

20.  $\log_3 27 + \ln(e^3) - \log 10^4 - 3 \log_2 32 + e^{\ln 3}$

21. **Condense:**  $\log_2 6x - 3 \log_2 2y + \log_2 24 - \log_2 3z$

22. You want to have \$1000 in your savings account. Find the amount that you should deposit if the account pays 4% annual interest over a period of 5 years.