3-2 Logarithmic Functions

Evaluate each expression.

2. $\log_{10} 10$

ANSWER:
1

4. $4^{\log_4 1}$

ANSWER:
1

6. $\log_2 2^3$

ANSWER:
3

8. $\log 0.01$

ANSWER:
–2

10. $\log_x x^2$

ANSWER:
2

12. $\ln e^{-14}$

ANSWER:
–14

14. $\ln (5 - \sqrt{6})$

ANSWER:
≈ 0.936

16. $4 \ln (7 - \sqrt{2})$

ANSWER:
≈ 6.88

18. $\frac{\ln 2}{\ln 7}$

ANSWER:
≈ 0.356

20. $\ln\left(\frac{1}{e^{12}}\right)$

ANSWER:

–12

22. $\log_{\sqrt[3]{4}} 64$

ANSWER:

21

24. log 1000

ANSWER:

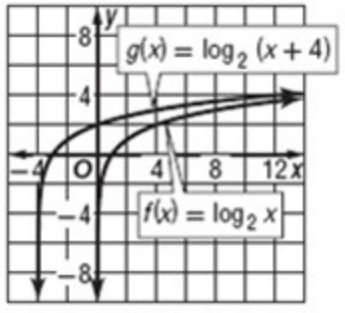
3

Use the graph of $f(x)$ to describe the transformation that results in the graph of $g(x)$. Then sketch the graphs of $f(x)$ and $g(x)$.

34. $f(x) = \log_2 x$; $g(x) = \log_2 (x + 4)$

ANSWER:

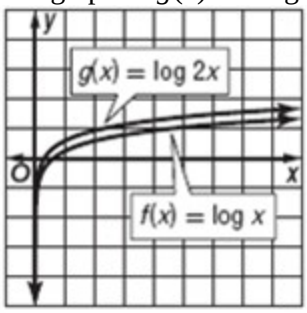
The graph of $g(x)$ is the graph of $f(x)$ translated 4 units to the left.



36. $f(x) = \log x$; $g(x) = \log 2x$

ANSWER:

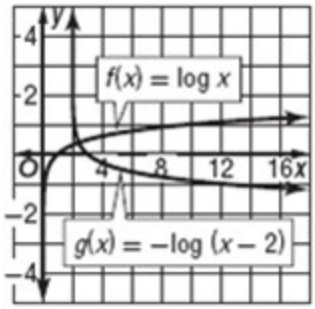
The graph of $g(x)$ is the graph of $f(x)$ compressed horizontally by a factor of 2.



38. $f(x) = \log x$; $g(x) = -\log (x - 2)$

ANSWER:

The graph of $g(x)$ is the graph of $f(x)$ reflected in the x-axis and translated 2 units to the right.



40. $f(x) = \log x$; $g(x) = -2 \log x + 5$

ANSWER:

The graph of $g(x)$ is the graph of $f(x)$ reflected in the x-axis, expanded vertically by a factor of 2, and translated 5 units up.