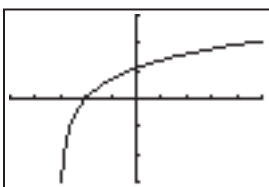
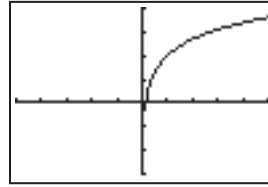


7. $\log 10^3 = 3$
8. $\log 10,000 = \log 10^4 = 4$
9. $\log 100,000 = \log 10^5 = 5$
10. $\log 10^{-4} = -4$
11. $\log \sqrt[3]{10} = \log 10^{1/3} = \frac{1}{3}$
12. $\log \frac{1}{\sqrt{1000}} = \log 10^{-3/2} = \frac{-3}{2}$
13. $\ln e^3 = 3$
14. $\ln e^{-4} = -4$
15. $\ln \frac{1}{e} = \ln e^{-1} = -1$
16. $\ln 1 = \ln e^0 = 0$
17. $\ln \sqrt[4]{e} = \ln e^{1/4} = \frac{1}{4}$
18. $\ln \frac{1}{\sqrt{e^7}} = \ln e^{-7/2} = \frac{-7}{2}$
19. 3, because $b^{\log_b 3} = 3$ for any $b > 0$.
20. 8, because $b^{\log_b 8} = 8$ for any $b > 0$.
21. $10^{\log(0.5)} = 10^{\log_{10}(0.5)} = 0.5$
22. $10^{\log 14} = 10^{\log_{10} 14} = 14$
23. $e^{\ln 6} = e^{\log_e 6} = 6$
24. $e^{\ln(1/5)} = e^{\log_e(1/5)} = 1/5$
25. $\log 9.43 \approx 0.9745 \approx 0.975$ and $10^{0.9745} \approx 9.43$
26. $\log 0.908 \approx -0.042$ and $10^{-0.042} \approx 0.908$
27. $\log(-14)$ is undefined because $-14 < 0$.
28. $\log(-5.14)$ is undefined because $-5.14 < 0$.
29. $\ln 4.05 \approx 1.399$ and $e^{1.399} \approx 4.05$
30. $\ln 0.733 \approx -0.311$ and $e^{-0.311} \approx 0.733$
31. $\ln(-0.49)$ is undefined because $-0.49 < 0$.
32. $\ln(-3.3)$ is undefined because $-3.3 < 0$.
33. $x = 10^2 = 100$
34. $x = 10^4 = 10,000$
35. $x = 10^{-1} = \frac{1}{10} = 0.1$
36. $x = 10^{-3} = \frac{1}{1000} = 0.001$
37. $f(x)$ is undefined for $x > 1$. The answer is (d).
38. $f(x)$ is undefined for $x < -1$. The answer is (b).
39. $f(x)$ is undefined for $x < 3$. The answer is (a).
40. $f(x)$ is undefined for $x > 4$. The answer is (c).
41. Starting from $y = \ln x$: translate left 3 units.



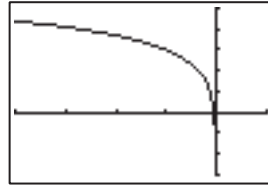
$[-5, 5]$ by $[-3, 3]$

42. Starting from $y = \ln x$: translate up 2 units.



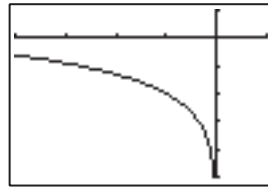
$[-5, 5]$ by $[-3, 4]$

43. Starting from $y = \ln x$: reflect across the y -axis and translate up 3 units.



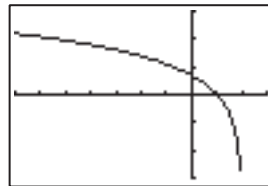
$[-4, 1]$ by $[-3, 5]$

44. Starting from $y = \ln x$: reflect across the y -axis and translate down 2 units.



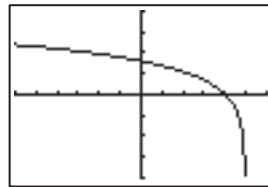
$[-4, 1]$ by $[-5, 1]$

45. Starting from $y = \ln x$: reflect across the y -axis and translate right 2 units.



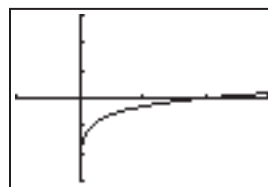
$[-7, 3]$ by $[-3, 3]$

46. Starting from $y = \ln x$: reflect across the y -axis and translate right 5 units.



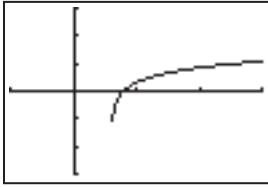
$[-6, 6]$ by $[-4, 4]$

47. Starting from $y = \log x$: translate down 1 unit.



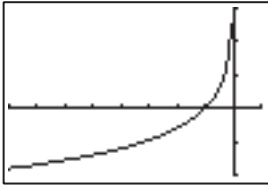
$[-5, 15]$ by $[-3, 3]$

48. Starting from $y = \log x$: translate right 3 units.



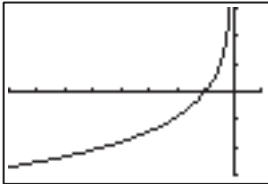
$[-5, 15]$ by $[-3, 3]$

49. Starting from $y = \log x$: reflect across both axes and vertically stretch by 2.



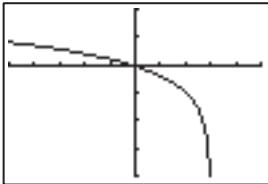
$[-8, 1]$ by $[-2, 3]$

50. Starting from $y = \log x$: reflect across both axes and vertically stretch by 3.



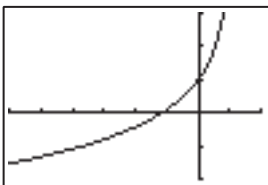
$[-8, 7]$ by $[-3, 3]$

51. Starting from $y = \log x$: reflect across the y -axis, translate right 3 units, vertically stretch by 2, translate down 1 unit.

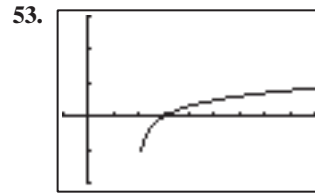


$[-5, 5]$ by $[-4, 2]$

52. Starting from $y = \log x$: reflect across both axes, translate right 1 unit, vertically stretch by 3, translate up 1 unit.

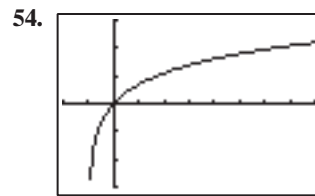


$[-6, 2]$ by $[-2, 3]$



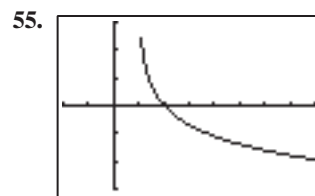
$[-1, 9]$ by $[-3, 3]$

Domain: $(2, \infty)$
 Range: $(-\infty, \infty)$
 Continuous
 Always increasing
 Not symmetric
 Not bounded
 No local extrema
 Asymptote at $x = 2$
 $\lim_{x \rightarrow \infty} f(x) = \infty$



$[-2, 8]$ by $[-3, 3]$

Domain: $(-1, \infty)$
 Range: $(-\infty, \infty)$
 Continuous
 Always increasing
 Not symmetric
 Not bounded
 No local extrema
 Asymptote: $x = -1$
 $\lim_{x \rightarrow \infty} f(x) = \infty$



$[-2, 8]$ by $[-3, 3]$

Domain: $(1, \infty)$
 Range: $(-\infty, \infty)$
 Continuous
 Always decreasing
 Not symmetric
 Not bounded
 No local extrema
 Asymptotes: $x = 1$
 $\lim_{x \rightarrow \infty} f(x) = -\infty$