7.1 EXERCISES

PRACTICE

Sketch the graphs of the following functions. State their domain and range. See Examples 1 and 2.

1. $f(x) = 4^x$
2. $g(x) = (0.5)^x$
3. $s(x) = 3^{x-2}$
4. $f(x) = \left(\frac{1}{3}\right)^{x+1}$
5. $r(x) = 5^{x-2} + 3$
6. $h(x) = 1 - 2^{x+1}$
7. $f(x) = 2^{-x}$
8. $r(x) = 3^{2-x}$
9. $g(x) = 3\left(2^{-x}\right)$
10. $h(x) = 2^{2x}$
11. $s(x) = (0.2)^{-x}$
12. $f(x) = \frac{1}{2^x} + 1$
13. $g(x) = 3 - 2^{-x}$
14. $r(x) = \frac{1}{2^{3-x}}$
15. $h(x) = \left(\frac{1}{2}\right)^{5-x}$
16. $m(x) = 3^{2x+1}$
17. $p(x) = 2 - 4^{2-x}$
18. $q(x) = 5^{3-2x}$
19. $r(x) = \left(\frac{9}{2}\right)^{-x}$
20. $p(x) = \left(\frac{1}{3}\right)^{2-x}$
21. $r(x) = 1 - \left(\frac{15}{4}\right)^x$

Solve the following exponential equations. See Example 3.

22. $5^x = 125$
23. $3^{2x-1} = 27$
24. $9^{2x-5} = 27^{x-2}$
25. $10^x = 0.01$
26. $4^{-x} = 16$
27. $2^x = \left(\frac{1}{2}\right)^{13}$
28. $2^{x+1} = 64^3$
29. $\left(\frac{2}{3}\right)^{x+3} = \left(\frac{9}{4}\right)^{-x}$
30. $\left(\frac{1}{5}\right)^{x-4} = 625^{\frac{1}{2}}$
31. $4^{3x+2} = \left(\frac{1}{4}\right)^{-2x}$
32. $5^x = 0.2$
33. $7^{x^2+3x} = \frac{1}{49}$
34. $3^{x^2+4x} = 81^{-1}$
35. $\left(\frac{1}{2}\right)^{x-3} = \left(\frac{1}{4}\right)^{x-5}$
36. $64^{x+\frac{7}{6}} = 2$
37. $6^{2x} = 36^{2x-3}$
38. $4^{2x-5} = 8^{\frac{x}{2}}$
39. $\left(\frac{2}{5}\right)^{2x+4} = \left(\frac{4}{25}\right)^{11}$
40. $4^{4x-7} = \frac{1}{64}$
41. $-10^x = -0.001$
42. $3^x = 27^{x+4}$
43. $1000^{-x} = 10^{x-8}$
44. $1^{3x-7} = 4^{2-x}$
45. $5^{3x-1} = 625^x$
46. $3^{2x-7} = 81^{\frac{x}{2}}$

Match the graphs of the following functions to the appropriate equation.

47. $f(x) = 2^{3x}$

48. $h(x) = 5^x - 1$

49. $g(x) = 2\left(4^{x-1}\right)$

50. $p(x) = 1 - 2^{-x}$

51. $f(x) = 6^{4-x}$

52. $r(x) = \dfrac{1}{3^x}$

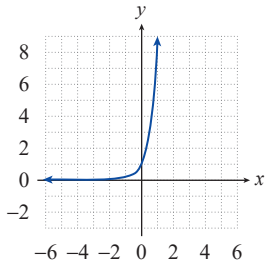
53. $m(x) = -2 + 2^{-3x}$

54. $g(x) = \left(\dfrac{1}{4}\right)^{1+x}$

55. $h(x) = 3^{\frac{1}{2}x}$

56. $s(x) = 1^x - 4$

a.



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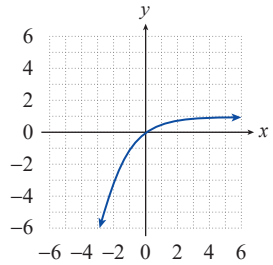

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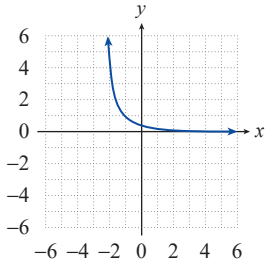

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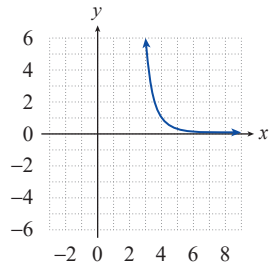

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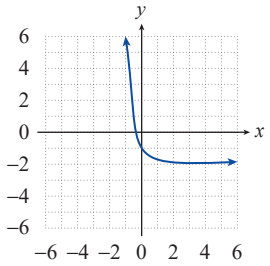

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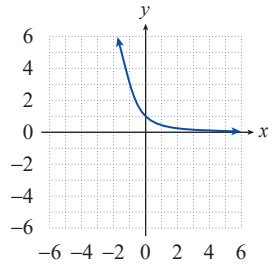

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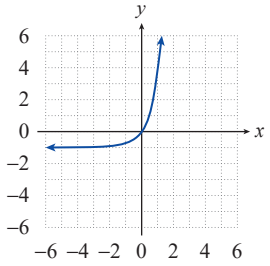

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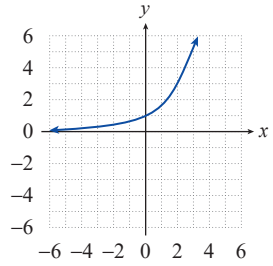
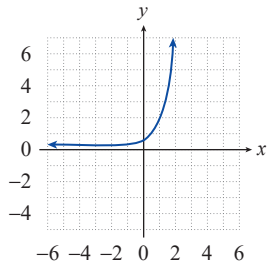


i.



j.