ERROR ANALYSIS *Describe* **and correct the error in simplifying the expression.**

17. $(3e^{5x})^2 = 3e^{(5x)(2)}$
$= 3e^{10x}$

18. $\frac{e^{6x}}{e^{-2x}} = e^{6x - 2x}$
$= e^{4x}$

EXAMPLE 2
on p. 492
for Exs. 19–30

EVALUATING EXPRESSIONS **Use a calculator to evaluate the expression.**

19. e^3 **20.** $e^{-3/4}$ **21.** $e^{2.2}$ **22.** $e^{1/2}$

23. $e^{-2/5}$ **24.** $e^{4.3}$ **25.** e^7 **26.** e^{-4}

27. $2e^{-0.3}$ **28.** $5e^{2/3}$ **29.** $-6e^{2.4}$ **30.** $0.4e^{4.1}$

GROWTH OR DECAY **Tell whether the function is an example of *exponential growth* or *exponential decay*.**

31. $f(x) = 3e^{-x}$ **32.** $f(x) = \frac{1}{3}e^{4x}$ **33.** $f(x) = e^{-4x}$ **34.** $f(x) = \frac{3}{5}e^{x}$

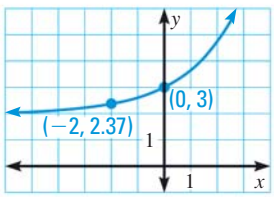
35. $f(x) = \frac{1}{4}e^{-5x}$ **36.** $f(x) = e^{3x}$ **37.** $f(x) = 2e^{4x}$ **38.** $f(x) = 4e^{-2x}$

EXAMPLE 3
on p. 493
for Exs. 39–50

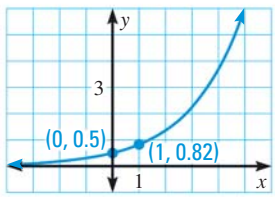
MATCHING GRAPHS **Match the function with its graph.**

39. $y = 0.5e^{0.5x}$ **40.** $y = 2e^{0.5x}$ **41.** $y = e^{0.5x} + 2$

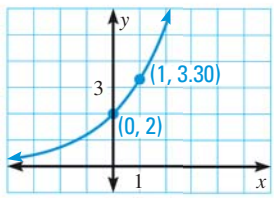
A.



B.



C.



GRAPHING FUNCTIONS **Graph the function. State the domain and range.**

42. $y = e^{-2x}$ **43.** $y = 3e^{x}$ **44.** $y = 0.5e^{x}$

45. $y = 2e^{-3x} - 1$ **46.** $y = 2.5e^{-0.5x} + 2$ **47.** $y = 0.6e^{x - 2}$

48. $f(x) = \frac{1}{2}e^{x + 3} - 2$ **49.** $g(x) = \frac{4}{3}e^{x - 1} + 1$ **50.** $h(x) = e^{-2(x + 1)} - 3$

51. **GRAPHING CALCULATOR** Use the *table* feature of a graphing calculator to find the value of n for which $\left(1 + \frac{1}{n}\right)^n$ gives the value of e correct to 9 decimal places. *Explain* the process you used to find your answer.

52. **SHORT RESPONSE** Can e be expressed as a ratio of two integers? *Explain* your reasoning.

53. **OPEN-ENDED MATH** Find values of a, b, r, and q such that $f(x) = ae^{rx}$ and $g(x) = be^{qx}$ are exponential *decay* functions and $\frac{f(x)}{g(x)}$ is an exponential *growth* function.

54. **CHALLENGE** *Explain* why $A = P\left(1 + \frac{r}{n}\right)^{nt}$ approximates $A = Pe^{rt}$ as n approaches positive infinity. $\left(\textit{Hint:}\ \text{Let } m = \frac{n}{r}.\right)$

= WORKED-OUT SOLUTIONS
= TAKS PRACTICE AND REASONING