LESSON 7.3 **Practice**
For use with pages 492–498

Simplify the expression.

1. $e^{-5} \cdot e^2$

$$e^{-3}$$

$$\boxed{\frac{1}{e^3}}$$

2. $e^3 \cdot e^{-3}$

$$\frac{x^3}{x^2}$$

3. $(e^4)^{-3}$

$$e^{-12}$$

$$\boxed{\frac{1}{e^{12}}}$$

4. $(2e^3)^2$

5. $\left(\frac{3e^3}{6e^2}\right)^2$

$$\left(\frac{1\,e}{2}\right)^2$$

$$\frac{1^2 e^2}{2^2} = \boxed{\frac{e^2}{4}}$$

6. $\left(\frac{8e^2}{2e^5}\right)^{-1}$

7. $3e^x \cdot 2e^{4x}$

$$\boxed{6e^{5x}}$$

8. $\sqrt{9e^4} \cdot 2e^{-3}$

9. $\dfrac{e^3}{e^{x+3}}$

$$e^{3-(x+3)}$$

$$e^{-x}$$

$$\boxed{\frac{1}{e^x}}$$

Use a calculator to evaluate the expression. Round the result to three decimal places.

10. e^7

11. $e^{-3/2}$

$$0.223$$

12. $e^{0.6}$

13. $e^{\sqrt{3}}$

$$5.652$$

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

14. $f(x) = 4e^{2x}$

15. $f(x) = e^{-5x}$

16. $f(x) = 6e^{-x}$

exponential decay.

14. $f(x) = 4e^{2x}$

15. $f(x) = e^{-5x}$

$\boxed{D}$

16. $f(x) = 6e^{-x}$

17. $f(x) = \dfrac{1}{4}e^{4x}$

$\boxed{9}$

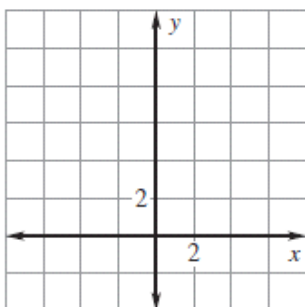**18.** $f(x) = \dfrac{1}{8}e^{-x}$

19. $f(x) = -e^{-x/2}$

$= -e^{-\frac{1}{2}x}$
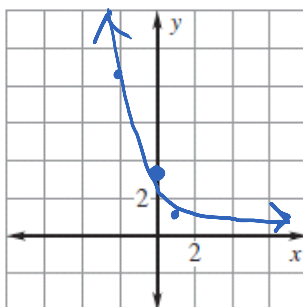
$= \dfrac{-1}{\sqrt{e^x}}$ $\boxed{D}$

Graph the function. State the domain and range.

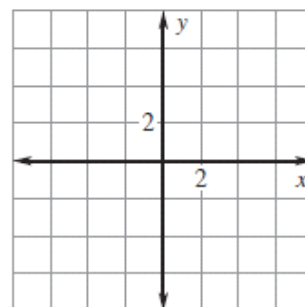**20.** $f(x) = 3e^x$

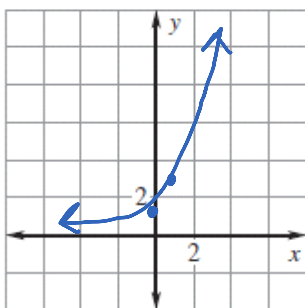**21.** $f(x) = 3e^{-x}$

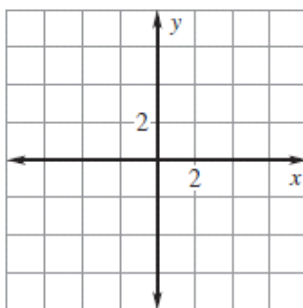R: $(0, \infty)$
D: $(-\infty, \infty)$

22. $f(x) = -e^x + 3$
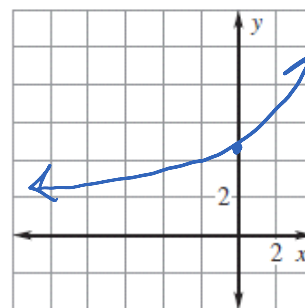

23. $f(x) = 2e^{x-1} + 1$

D: $(-\infty, \infty)$
R: $(1, \infty)$

24. $f(x) = \dfrac{1}{2}e^{x-2} - 3$

25. $f(x) = e^{2x+1} + 2$

$r = 2$

D: $(-\infty, \infty)$
R: $(2, \infty)$

In Exercises 26 and 27, use the following information.

Finance You deposit $2200 in an account that pays 3% annual interest. After 15 years, you withdraw the money. $\;\; p$

$0.03 = r \qquad\qquad t$

26. What is the balance if the interest is compounded quarterly? $15 \times 4 = 60$

$$y = 2200\left(1 + \frac{.03}{4}\right)^{15 \times 4} \qquad n = 4$$

$$y = 2200(1.0075)^{60} = \boxed{\$3444.50}$$

27. What is the balance if the interest is compounded continuously?

$$y = Pe^{rt}$$

$$y = 2200e^{.03(15)} = \boxed{\$3450.29}$$