EXAMPLE 4 on p. 531 for Exs. 15–22

WRITING POWER FUNCTIONS **Write a power function $y = ax^b$ whose graph passes through the given points.**

15. (4, 3), (8, 15) **16.** (5, 9), (8, 34) **17.** (2, 3), (6, 12) **18.** (3, 14), (9, 44)

19. (4, 8), (8, 30) **20.** (5, 10), (12, 81) **21.** (4, 6.2), (7, 23) **22.** (3.1, 5), (6.8, 9.7)

EXAMPLE 5 on p. 532 for Exs. 23–26

FINDING POWER MODELS **Use the given points (x, y) to draw a scatter plot of the points $(\ln x, \ln y)$. Then find a power model for the data.**

23. (1, 0.6), (2, 4.1), (3, 12.4), (4, 27), (5, 49.5) **24.** (1, 1.5), (2, 4.8), (3, 9.5), (4, 15.4), (5, 22.3)

25. (1, 2.5), (2, 3.7), (3, 4.7), (4, 5.5), (5, 6.2) **26.** (1, 0.81), (2, 0.99), (3, 1.11), (4, 1.21), (5, 1.29)

27. **MULTIPLE CHOICE** Which equation is equivalent to $\log y = 2x + 1$?

Ⓐ $y = 10(100)^x$ Ⓑ $y = 10^x$ Ⓒ $y = e^{2x+1}$ Ⓓ $y = e^2$

ERROR ANALYSIS ***Describe*** **and correct the error in writing y as a function of x.**

28.

$\ln y = 2x + 1$

$y = e^{2x+1}$

$y = e^{2x} + e^1$

$y = (e^2)^x + e$

$y = 7.39^x + 2.72$

29.

$\ln y = 3 \ln x - 2$

$\ln y = \ln 3x - 2$

$y = e^{\ln 3x - 2}$

$y = e^{\ln 3x} \cdot e^{-2}$

$y = (3x)(0.135) = 0.405x$

30. **CHALLENGE** Take the natural logarithm of both sides of the equations $y = ab^x$ and $y = ax^b$. What are the slope and y-intercept of the line relating x and $\ln y$ for $y = ab^x$? of the line relating $\ln x$ and $\ln y$ for $y = ax^b$?

PROBLEM SOLVING

GRAPHING CALCULATOR **You may wish to use a graphing calculator to complete the following Problem Solving exercises.**

EXAMPLES 2, 3, 5, and 6 on pp. 530–533 for Exs. 31–35

31. **BIOLOGY** Scientists use the circumference of an animal's femur to estimate the animal's weight. The table shows the femur circumference C (in millimeters) and the weight W (in kilograms) for several animals.

Animal	Giraffe	Polar bear	Lion	Squirrel	Otter
C (mm)	173	135	93.5	13	28
W (kg)	710	448	143	0.399	9.68

a. Draw a scatter plot of the data pairs $(\ln C, \ln W)$.

b. Find a power model for the original data.

c. Predict the weight of a cheetah if the circumference of its femur is 68.7 millimeters.

TEXAS @HomeTutor for problem solving help at classzone.com

= WORKED-OUT SOLUTIONS

= TAKS PRACTICE AND REASONING