

Sec 4.2.4  
Applications

The percentage of adult height attained by a boy who is  $x$  years old can be modeled by

$$f(x) = 29 + 48.8 \log(x+1)$$

← age  
← percent

where  $x$  represents the boy's age (from 5-15) and  $f(x)$  represents the percentage of adult height.  
Approximately what percentage of adult height has a boy attained at age 8?

$$\begin{aligned} &= 29 + 48.8 \log(8+1) \\ &\approx 75.5\% \end{aligned}$$

The magnitude,  $R$ , on the Richter scale of an earthquake of intensity  $I$  is given by

$$R = \log I/I_0$$

where  $I_0$  is the intensity of a barely felt zero-level earthquake. The earthquake that destroyed San Francisco in 1906 was  $10^{8.3}$  times as intense as a zero-level earthquake. What was its magnitude on the Richter scale?

When the outside air temperature is anywhere from  $72^\circ$  to  $96^\circ$  Fahrenheit, the temperature in an enclosed vehicle climbs by  $43^\circ$  the first hour. The function  $f(x) = 13.4 \ln x - 11.6$  models the temperature increase,  $f(x)$ , in degrees Fahrenheit, after  $x$  minutes. Use the function to find the temperature increase after 50 minutes.

$$f(x) = 13.4 \ln 50 - 11.6$$

$$40.82 \approx 41^\circ \text{ increase}$$

113. 95.4%

114. 89.2%

115. a. 25.5%

b. 24.2%

Suggested Practice

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113-116,

119a, b

a. 14.8%

116. b. 14.0%

119. a. 88

b. 71.5

63.9

58.8

55

52

49.5