Can We Predict Maximum Heart Rate?

Understanding heart rate can be an important tool for your own personal exercise training and for monitoring your cardiovascular health. One measure that is often calculated is your maximum heart rate, or HRmax. Your maximum heart rate depends on your age.

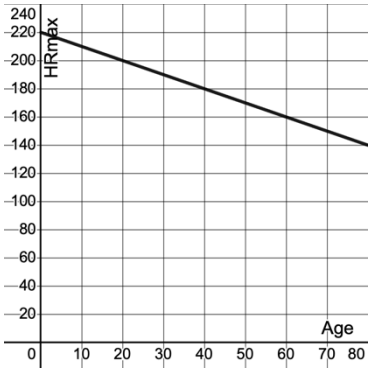
1. The table below gives data about the relationship between age and HRmax, measured in beats per minute.

Age	HRmax (in bpm)
14	206
18	202
25	195
40	180
50	170
72	148

   a. Describe the relationship between age and maximum heart rate.

   b. Predict the maximum heart rate of a 35-year-old. Explain your method.

2. The graph also shows this relationship.



   a. What is the maximum heart rate of a 60-year-old?

   b. What age would you predict for someone who has a maximum heart rate of 200 bpm?

   c. Write an equation that that can be used to determine the maximum heart rate of someone who is x years old.

   d. What do you think are reasonable values for x in your equation? Explain.

   e. Do you think it is possible to have a maximum heart rate of 100 beats per minute? Explain why or why not.

3. While the formula found above is easy to use, researchers found it to be less accurate for women. They proposed the function $H(x) = 206 - 0.88x$ to estimate the maximum heart rate, $H(x)$, for a woman that is x years old. Find $H(32)$ and interpret your answer in the context of this problem.

Lesson 1.1 – Functions and Function Notation

QuickNotes

Check Your Understanding

1. The volume of a sphere with radius r is given by the function $V(r) = \frac{4}{3}\pi r^3$.
   a. What is the independent variable of this function? What is the dependent variable?

   b. Complete the table of values.

r	$V(r)$
1	
3	
5	
7	

   c. Describe how increasing the radius affects the volume.

   d. What is a reasonable domain for this function? What is a reasonable range for this function?

2. The length of the skid mark left by a car when braking, in feet, can be used to predict the speed, in miles per hour, at which the car was driving when it hit the brakes. The speed of the car is given by the square root of 21 times the length of the skid mark. Use function notation to write this function rule. Clearly define your variables.